

THE STRATEGIC INFORMATION MANAGEMENT PLAN

OF THE AUTOMATED COMMERCIAL ENVIRONMENT

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THE STRATEGIC INFORMATION MANAGEMENT PLAN OF THE AUTOMATED COMMERCIAL ENVIRONMENT

1.0 INTRODUCTION

The Automated Commercial Environment (ACE) is the future automated international trade information system being developed by the United States Customs Service for enforcing trade and contraband laws, ensuring trade compliance, and providing service and information to the trade community, federal agencies, and to the American public. ACE will be entirely new and different, not merely an enhancement to the existing Automated Commercial System (ACS). Through state-of-the-art technology integrated with completely re-engineered operational processes, ACE will enable the Customs Service to meet its mission objectives and to satisfy the nation's ever-increasing demand for international trade-related services and information well into the 21st century.

1.1 The Strategic Information Management Plan

The ACE **Strategic Information Management Plan** (SIMPlan) describes at a conceptual level what the new Automated Commercial Environment will look like, how it will work, and the strategic plan for delivering the working system. The plan consists primarily of three architectures, which when taken together, provide the foundation for the new system to be developed. These architectures are described briefly below:

Information Architecture

The Information Architecture defines the processes and functions performed by Customs and the information required to support them. It forms the foundation for the other architectures.

Systems Architecture

The Systems Architecture describes the automation components required to support the Information Architecture and provides a high-level initial prediction of the application systems to be developed.

Technical Architecture

The Technical Architecture describes the hardware and software environment and communication components required to support the System Architecture.

1.1.1 Purpose of the Strategic Information Management Plan

The purpose of this Strategic Information Management Plan (SIMPlan) is:

- * to document the high-level trade information requirements of the Customs Service;
- * to describe how the future ACE will look and function, providing the foundation for continued development of the system;
- * to present this information for Customs management's evaluation and approval for the direction of the ACE development effort; and perhaps most importantly,
- * to generate feedback on the proposed system from future field, trade, and government users of ACE.

1.1.2 Document Organization

In addition to describing the ACE project approach, this document contains five key components:

- * *Basic Requirements Integration* (Section 3.0) describes the high-level automation requirements of the Customs commercial trade mission, as represented by six major Customs initiatives.
- * *The Information Architecture* (Section 5.0) specifically focuses on the five Trade Compliance processes, their associated subprocesses, and the information required to perform them.
- * *The System Architecture* (Section 6.0) discusses the probable systems for supporting the information needs; it also covers the major system functions which span individual processes.
- * *The Technical Architecture* (Section 7.0) describes the hardware and software needs of the new system.
- * *Transition and Implementation* (Section 8.0) discusses the implementation issues for ACE, and in particular, how best to carry out the transition from the legacy system, ACS, to ACE, including the likely effects on both internal and external users.

Included as appendices are listings of the people and businesses involved in the ACE development project, both internal and external; reference documents; and a glossary.

1.2 The Charter of the Automated Commercial Environment Development Team

On April 19, 1994, Commissioner George J. Weise established the ACE Development Team, and chartered the team to redesign the Automated Commercial System (ACS).

The ACE Development Team is using the ***Report of the Future Automated Commercial Environment Team***, issued December 30, 1993, as the conceptual starting point from which to continue the redesign of the Customs commercial system. That document outlines a high-level vision of the type of information processing system that Customs will need to accomplish its international trade mission in the 21st century. The ACE Development Team will further define and realize that vision to fully support Customs' future international trade processes now being defined by the Trade Compliance Process Owner and the Process Improvement Teams under his direction. Section 2.1, Process Analysis and Redesign, discusses this initiative in greater detail.

1.3 The Case for Action: Why Redesign ACS?

The Automated Commercial System (ACS) is among the most successful automation efforts in the federal government. ACS supports approximately 16,000 Customs users, and electronically communicates with more than 1,500 trade participants, primarily through its Automated Broker Interface (ABI) and Automated Manifest System (AMS). ACS also serves many federal agencies involved in international trade through direct access via ACS terminals, electronic interfaces, and by providing information as data tapes, printed reports, or other means. Since beginning operations in February 1984, ACS has allowed the Customs Service to handle a rapid increase in the number and complexity of import transactions with static staffing levels, while vastly improving data accuracy and the tracking and control of tens of millions of entries annually.

If ACS is such a success, why does the Customs Service wish to redesign it? There are three primary reasons:

- * ACS is now more than 10 years old, and showing its age. Internal and external system users demand more functionality and processing capacity from ACS than its current mainframe architecture and data structure can support. Making enhancements to the current system is becoming increasingly more difficult and expensive.

- * Desirable new technology is often incompatible with the hardware and software of this aging system.
- * Perhaps most importantly, the business of Customs commercial processing has significantly evolved since ACS was first designed. Today's applications for handling entries, entry summaries, and manifests simply will not support the business changes demanded by an increasingly complex new trade environment.

These three factors -- the aging system, the difficulty in integrating new technology into such a system, and the need to redesign major core business applications -- require that Customs not just continue to maintain and enhance the existing ACS. It is time to start over.

1.3.1 The Legacy System: The Automated Commercial System (ACS)

As stated above, the success of ACS and its importance to the Customs Service and to the international trade community are significant, but ACS also has a number of serious problems and limitations:

- * ACS is not 'user-friendly.'
- * ACS requires frequent and costly upgrades to meet daily processing demand; when upgrades are delayed, key internal functions must be curtailed to maintain the processing performance for trade interface transactions.
- * The current data base and hardware structure maximizes transaction processing speed, but severely limits reporting and analysis capabilities.
- * ACS lacks sufficient management reporting capabilities, performance measures, audit trails and internal controls.
- * ACS modules were designed primarily to support organizations rather than processes, resulting in system functions which reflect organizational boundaries and do not share data with one another.
- * Multiple ACS modules and subroutines perform similar functions (e.g. cargo release and line release), but are not integrated with one another.
- * ACS lacks consistent systems documentation and data standards.

These fundamental problems are not easily or cost-effectively addressed by programming enhancements or the addition of new processors or data storage devices to the existing system.

1.3.2 New Technology Opportunities

Customs is migrating from its current mainframe architecture towards a distributed computing environment which employs client-server technologies. The Customs Distributed Computing (CDC-2000) approach integrates existing mainframe equipment with specialized servers and Local Area Networks (LANs) of personal computer (PC) workstations. This hybrid solution allows specific processing activities to be distributed to the computer best suited for a particular task.

One of the mission objectives defined in the Office of Information Management's *CDC-2000 Strategic Plan: Reaching Out to Meet Customs Future Information Needs* is to accommodate varied terminal devices such as image scanners, biometrics tools, passport readers and other specialized technology. Because the number of PC-based technologies has dramatically increased in the past ten years, this objective is now achievable. During this same time, intense competition in the personal computer market has caused an unprecedented drop in the cost of hardware and peripheral devices.

Customs has not been able to effectively capitalize on new technology opportunities with its existing automated systems based on a mainframe architecture. The few PC-based applications developed by Customs are highly specialized and have not been well integrated with other systems. An example of this is especially apparent at some land border locations, where an inspector needs a Line Release PC, a TECS PC, and an ACS terminal to process commercial vehicles. This equipment conglomeration does not lend itself to the addition of new devices such as "smart-cards" and transponders. However, the installation of powerful, standardized PC workstations and servers in accordance with the CDC-2000 strategy should facilitate the incorporation of desired technologies into the Automated Commercial Environment.

1.3.3 The Changing Environment: Reorganization, New Legislation, Initiatives, Oversight Agency Recommendations

The environment in which the Customs Service now must function has changed rapidly since the development of ACS. Major new legislation, important new federal executive initiatives, the recommendations of oversight agencies, and our own reorganization plan, not only require that Customs reexamine how it carries out its fundamental processes, but also provide new opportunities for a total rethinking of the way that we design and deploy information technology. And change continues -- already the next General Agreement on Tariffs and Trade (GATT) is on the horizon, awaiting Congressional decision. The major forces of change are listed below, along with a brief description of their effect on, or need for, information technology.

- * **The Reorganization of the Customs Service:** In September 1994, Treasury Secretary Bentsen approved the Commissioner's plan for reorganizing the Customs Service. More than simply detailing the new organizational structure of the Customs Service, the plan sets forth a vision for the future, and describes changing the culture of the organization, moving toward management by process, forming partnerships with customers, and providing the training and management to build a workforce for the next century. A very significant result of the plan is the naming of the Trade Compliance process owner and the initiation of Customs trade process redesign. The plan also places increased emphasis on information technology.
- * **Customs Modernization:** By eliminating many antiquated statutory provisions, the Customs Modernization legislation both permits and requires Customs to take a new view of international trade, its commercial operational requirements, and the methods for processing data electronically. Key components of Customs Modernization include the concept of informed compliance, the legitimization of electronic processing, and the significant new automation capabilities of remote location filing, reconciliation, and periodic submission of entry data and associated duties, taxes and fees.
- * **The North American Free Trade Agreement (NAFTA):** NAFTA provides for lowered duties and trade barriers among the three signatory countries, new and more complex rules of origin, and mechanisms relieving domestic industries of injury stemming from NAFTA imports. NAFTA also requires the facilitation of the free flow of trade through standardization of government requirements and information systems.
- * **The Chief Financial Officers (CFO) Act:** This legislation requires federal agencies to practice effective financial management, and provides for improvement of an agency's systems of accounting, financial management and

internal controls. In particular, it requires agencies to produce complete, reliable, timely and consistent financial information, including auditable financial statements. The Department of the Treasury and Commissioner Weise have set for Customs the goal of receiving an 'unqualified' opinion for the fiscal year 1996 statement, which through accurate and timely financial data would indicate that sound financial management practices are in place within the agency.

- * **The Government Performance and Results (GPRA) Act and Executive Order 12862, Setting Customer Service Standards:** The Government Performance and Results Act (GPRA) requires that federal agencies define their missions and develop five-year strategic plans, annual performance plans that specify measurable goals, and annual reports showing how they are doing on those measures. In a similar vein, Executive Order 12862, *Setting Customer Service Standards*, requires agencies to establish and post customer service standards.
- * **The National Performance Review (NPR):** The National Performance Review outlines a number of key administration goals, including putting the customer first; empowering employees and holding them accountable; delivering government benefits, services, and information electronically; and reengineering government programs to cut costs and increase efficiency. An addendum to the Report, *Reengineering Through Information Technology*, discusses the establishment of an international trade data system. This international trade data system is further described in Section 3.2.2.
- * **Oversight Agency Reports and Recommendations:** In recent years, the General Accounting Office, Inspector General, and Congress have noted a number of problems and deficiencies in Customs' management practices, financial controls, operational programs and procedures, and automated systems. Many will be addressed through the Customs Reorganization effort, but the effective and systematic design of ACE will also resolve those issues involving information gathering, processing, control, and reporting.
- * **Customs Five Year Plan and Annual Plans:** The Customs Five Year Plan, written in 1993 and updated annually, outlines the Customs mission and the strategies for accomplishing this mission. Two strategies, Trade Enforcement and Outbound, directly involve the international movement of cargo, and so require information support from the Customs commercial information system.
- * **Office of Information Management Strategic Plan:** The Strategic Plan of the Office of Information Management (now Office of Information Technology, OIT) describes the role of information management and technology in supporting the goals and objectives set forth in the Customs strategic plans. The OIT's strategic goal is to provide to Customs personnel the information resources and

support required to achieve the Customs mission, and to provide the data necessary to support other agency requirements at the border.

2.0 THE PROJECT APPROACH

This section describes how and with whom the ACE Development Team is working to identify, coordinate, and document the operational and technical requirements for the new Automated Commercial Environment. The Report of the Future Automated Commercial Environment Team provides the conceptual starting point, reflecting as it does input from Customs field, trade community, and government agency users. ACE is continuing the analysis of functional and technical requirements for the new system through two primary avenues:

- * by coordinating closely with the initiative headed by the Trade Compliance Process Owner to thoroughly reexamine and redesign the Customs commercial processes, and
- * by obtaining and incorporating the ideas and comments of future system users, both internal and external.

To guide the system development effort, the ACE Development Team will use as a framework the standard Customs System Development Life Cycle (SDLC) and the Information Engineering (IE) methodologies. These methodologies are further described in Section 2.5.

2.1 Process Analysis and Redesign

In the past, most new ACS modules simply automated existing Customs forms and the associated manual procedures. The underlying Customs processes were seldom analyzed and redesigned before initiating and implementing the automated programs. As a result, ACS can no longer adequately support Customs commercial processing in today's rapidly-changing international trade environment.

In their report, *People, Processes, and Partnerships*, the Customs Reorganization Team recommended that Customs move to management by process, rather than by organizational "stovepipes." In June 1994, the Commissioner selected a cargo process owner, Mr. Charles Winwood, and tasked him with the redesign of that process. The process owner named a group of senior customs executives to serve with him as a board of directors to provide vision, strategy, and policy oversight throughout the redesign of the cargo process.

The Board of Directors defined the scope of the cargo process as starting prior to the importation of merchandise with outreach and pre-importation review, and ending with the archiving of the transaction data. Export is included, but only so far as it affects the importation process and parallel import and export data needs and technology

solutions are identified. To reflect Customs new emphasis on informed compliance as well as enforced compliance, the Board of Directors renamed the cargo process **Trade Compliance**, and divided it into five component processes: *Service Accounts*, *Target*, *Verify*, *Enforce*, and *Manage Revenue*. The board also identified the high-level Trade Compliance goals, strategies, objectives and performance measures. Section 3.1 provides an overview of the Trade Compliance processes; Section 5.1 discusses the processes and their associated subprocesses in more detail.

The process analysis and design work will be done by Process Improvement Teams (PITs) trained in process redesign techniques. Each of the five Trade Compliance processes has its own PIT comprising a "champion" from the Board of Directors, a team leader, and 6 to 10 team members with expertise from all Customs operational disciplines.

The PITs will begin by analyzing existing processes through on-site observation and by using techniques such as process mapping, cycle time measurements and customer analysis, to identify which parts of each process work well and which do not. Six prototype ports have been identified to serve as process "laboratories" for the PITs: Detroit, Laredo, New York, Philadelphia, Seattle, and Charleston. These ports will provide the PITs with process maps (flowcharts) of key operational processes as they exist today. These maps will help the teams determine the level of improvement needed by each process or subprocess: radical change, moderate improvement, or minor enhancement. Where possible, the prototype ports will adjust or eliminate inefficient and redundant aspects of today's processes (provided they do not require changes to automated systems, forms, or regulations), so that Customs can realize some short-term benefits quickly.

The teams will design the new processes and verify their concepts by testing them out as prototypes in the six prototype ports. When the new processes have been validated and approved, the teams must begin laying the foundation for implementation, including training, writing new regulations and standard operating procedures, negotiating with the union, and resolving other work force issues. After implementation, the teams will evaluate their success against the baseline performance measures taken of today's processes.

At this writing, the PITs are actively analyzing the existing processes. The Board of Directors expects that the teams will complete the basic redesign of the processes within the next four to six months, after which prototyping and testing will begin.

The ACE Development Team is actively working with the Trade Compliance Board of Directors and the PITs; in particular, an ACE member participates on each of the five PITs to provide technical expertise and to obtain the automation requirements for the new processes which ACE must support. The goal is to reduce the amount of

time between the implementation of the new processes and the availability of the supporting, and in some cases even enabling, automated capabilities.

Appendix E references some of the widely-respected resources about process management and redesign which Customs has used.

2.2 Multi-Project Approach

In recent years, Customs has initiated a number of significant automation projects in the commercial trade area. These projects include Selectivity Redesign, Customs Automated Revenue Accounting (CARA), the Automated Export System (AES), the International Trade Data Exchange (INTRADEX), and of course, the Automated Commercial Environment. Each project has specific goals, objectives, and deliverables which it continues to work toward. Since the end results of each project must ultimately function together operationally and be supported by a seamlessly integrated automated system, ACE, continuous and disciplined coordination among all projects is essential.

The Trade Compliance Board of Directors has brought four of the five projects under the Trade Compliance umbrella to ensure consistency of vision, strategy and leadership being provided to them. As discussed in Process Analysis and Redesign, Section 2.1, ACE has been working in close coordination with the Board of Directors from the very beginning. Selectivity Redesign and INTRADEX are now being overseen by the *Target* process; CARA is now within the scope of the *Manage Revenue* process.

The exception, at least in the short to mid-term, is the Automated Export System. This is due to two reasons: 1) AES has an accelerated development schedule; and 2) because Customs' legal responsibilities for exports are sufficiently different from imports, the Board of Directors excluded most export activities from the Trade Compliance scope.

The Trade Compliance vision embodies the key Customs Modernization Act concept of informed compliance, and also relies upon many other provisions of the legislation. Although no formal Customs Modernization automation project exists today, the act contains significant changes to existing automated processes and authorizes Customs to pursue significant new automated capabilities. These, too, must be coordinated with the overall ACE development effort, under the direction and guidance of Trade Compliance.

This section describes the role of each project relative to ACE, and how the ACE Development Team is supporting and coordinating their automation development activities through the preparation of, and adherence to, a formal Project Management methodology.

2.2.1 Roles and Responsibilities of the Projects

Successful coordination will eliminate (or at least greatly reduce) duplicate, and potentially conflicting, work effort by multiple groups. To this end, each project is responsible for a specifically defined segment of the Automated Commercial Environment, briefly described below. (The automation requirements of each project are described in greater detail in Section 3.1, Basic Requirements.)

Selectivity Redesign is analyzing, integrating and reengineering Customs commercial targeting systems (manifest, cargo, and entry summary) using a statistically-based approach. New analytical methods to support targeting activities are also being explored and tested. Selectivity Redesign has extensively involved field users throughout the requirements definition process. Once they, together with the *Target* PIT, have finalized the system design for the targeting and analysis functions, the programming and implementation of the new targeting systems will be done by the ACE Development Team to ensure their complete integration with the rest of ACE.

The International Trade Data Exchange (INTRADEX) is gathering and coordinating the international trade information requirements of federal government agencies, with the ultimate goal of designing the international trade data system proposed in the National Performance Review, Section IT-06. INTRADEX, along with the Office of Management and Budget and the Government Information Technology Services working group, is meeting regularly with U.S. federal agencies involved in international trade to determine their requirements. The ACE Development Team is working closely with INTRADEX to ensure that ACE will meet the trade information needs of these agencies. INTRADEX is also coordinating with the governments of Canada and Mexico for designing and testing a prototype of fully electronic trade transaction processing among the three NAFTA countries. As with Selectivity Redesign, once INTRADEX has developed their user requirements and system designs, ACE is responsible for programming the prototype and final systems.

The Automated Export System (AES) is developing a system for capturing, processing and reporting information on exports. Since AES is on a much shorter time schedule than ACE's development, it is being designed based on Customs current mainframe system. By working closely with AES throughout their design process to ensure ease of transition, and consistent data definitions and development methodology, ACE will be able to accommodate the eventual integration of AES, should the Executive Improvement Team decide this is necessary. To the extent possible, AES will incorporate the same Trade Compliance elements upon which ACE will be based - *Service Accounts, Target, Verify, Enforce, Manage Revenue, and Report International Trade Statistics*.

The Customs Automated Revenue Accounting (CARA) project was initiated to identify and design the automated capabilities for a financially-sound revenue accounting system according to the Chief Financial Officers Act, including the necessary controls and reporting mechanisms. The CARA project has recently been folded into the overall Trade Compliance scope under the *Manage Revenue* process, and CARA's technical staff has joined the ACE Development Team. The *Manage Revenue* PIT and the ACE Development Team will use CARA's analysis of Customs financial accounting requirements as the foundation for their work in this area.

The **Customs Modernization** provisions of NAFTA enable Customs to modernize its procedures, in part by authorizing significant new automation initiatives including remote location filing, reconciliation, and the importer activity summary statement (IASS). The development of these capabilities will be done as part of the integrated redevelopment of the Trade Compliance processes by the PITs.

The Automated Commercial Environment project is not only responsible for developing the rest of the ACE, but also for integrating the automation requirements of the above projects into that system. ACE's project integration responsibilities include:

- * *Management oversight and project coordination:* Project managers meet as needed to discuss common management, budget, scheduling and other issues. In addition, an ACE Development Team member is assigned to each project to serve as a liaison between that project and ACE.
- * *Common project planning and budgets, and integrated strategic planning:* Section 2.2.2 below describes these activities.
- * *Establishment of a Customs-wide data base:* Data belongs to the Customs Service, not to specific users or projects; therefore a single Customs-wide data base will serve the requirements of all ACE-related projects to avoid data duplication and conflict.
- * *Coordinated system and technical architecture requirements:* Since the results of all projects will be integrated in a single system, their system and technical requirements must be coordinated to ensure development and/or procurement of the appropriate software and hardware.
- * *Development of common data, user interface, and other standards:* Once defined by the ACE Development Team in coordination with the other project teams, these standards will apply to all ACE-related automation projects.

2.2.2 Project Management

To coordinate and manage this activity, the multiple ACE-related automation project teams are following a structured and disciplined Project Management methodology. Using this methodology, a clear plan has been established for managing project activity and measuring performance. The ACE Project Management Plan (PMP) provides details as to the objectives of the overall ACE project, as well as work breakdown, organization breakdown, and schedule and resource information. It includes distinct performance measures so that ACE project performance can be effectively analyzed and managed throughout the systems development life cycle. The PMP also defines common objectives and identifies potential schedule, task, and resource duplication or conflict.

Each ACE-related project has also developed its own individual project plan, which details strategies for achieving its goals and objectives, as well as project-specific work breakdown structures, schedules, and resource information. Schedule and resource interdependencies will be continuously tracked to ensure that the individual project objectives are met.

ARTEMIS Prestige, a project management software tool from Lucas Management Systems, facilitates the implementation of the PMP strategies and criteria by helping project managers monitor their project cost, schedule, resource, and performance information. Using the tool, project managers can generate an integrated picture of the systems development plan, including project interdependencies, without compromising the integrity of the individual project plans. Early warning and "What If" analysis will be performed using the tool to identify actual or potential project problems, and to ensure that individual project and ACE development goals and objectives are successfully met.

2.3 Field and Trade User Input

Although the Trade Compliance PITs will be the primary source of operational requirements for the new commercial environment, the ACE Development Team recognizes that Customs field users, the trade community, and other government agencies must also play an integral part in ACE's development. Consequently, a Field Support Network and a Trade Support Network have been established. As mentioned above, the INTRADEX project is obtaining input from government agencies.

The fifty Field Support Network (FSN) members represent all Customs professions (agents, inspectors, import specialists, entry officers, etc.), the various port types (land border, sea, air, courier hub, etc.), and small as well as large operations. The ACE Development Team uses the FSN as a sounding board for ideas and designs, and will furnish system prototypes to obtain their hands-on input. In turn, the field representatives will solicit ideas, comments, and questions on what is required of the

new system from field users within their geographic area. The ACE Development Team plans to communicate with FSN members through video conferencing, e-mail (establishing an ACE network and/or bulletin board), site visits, and national conferences.

In September 1994, the first national Field Support Network conference was held in Washington, DC. The purpose of the conference was to agree upon the role of the FSN members, to brief them on the Trade Compliance process design effort, and to obtain their comments and ideas on work done to date by the ACE Development Team. Breakout sessions focused on the five Trade Compliance processes and their corresponding automation needs. This document reflects the input received during that conference, particularly concerning system requirements. The FSN's input on policy and procedural issues has been provided to the appropriate PIT.

The Trade Support Network (TSN) serves much the same purpose as the Field Support Network, but from the trade community's perspective. TSN members represent the brokerage, importer, carrier, courier, port authority and other trade-related industries, and will be responsible for gathering information about the trade community's requirements of the new system. The ACE Development Team will communicate with TSN members through the Customs Electronic Bulletin Board, site visits, industry focus groups, and possibly video conferencing.

The Field Support and Trade Support Networks will also be resources for the Trade Compliance PITs as they undertake the design of the new Trade Compliance processes. Through this approach, ACE and the Trade Compliance Board of Directors expect to coordinate the gathering of Customs field and trade community user requirements for the operational processes with those for the automated systems that support them.

2.4 ACE Development Team Organization

The five Trade Compliance processes represent such an intuitive and direct way to approach the Customs commercial mission that the ACE Development Team decided to organize itself accordingly. A team of both operational and technical personnel is assigned to each of the five processes and is responsible for developing the automated functions needed to support that process. A sixth team is addressing the system-wide functions that support all of the business processes.

By organizing in this way, the ACE Development Team expects to emphasize the Customs *operational processes*, not the structure of the organization. This approach also promotes a close and consistent working relationship with the PITs: a member

from each ACE process team will actively participate on the corresponding PIT, both to provide technical input and to obtain user requirements.

2.5 ACE Development Methodology

The ACE Development Team is following the methodology described in the Customs *System Development Life Cycle (SDLC) Handbook* to ensure that development activities focus on satisfying the needs of those who will ultimately use the system. The procedures identified in the Treasury Department's *Information System Life Cycle (ISLC) Manual* (TD P 84-01, July 1994) are also being followed to assist the ACE project management team in establishing adequate management and control mechanisms. Both life cycle methodologies are reflected in the tasks included in the ACE Project Management Plan described in Section 2.2.2.

At various points in the system life cycle, ACE will identify and use appropriate development methodologies for accomplishing project tasks. The ACE Development Team is using the Information Engineering methodology (IE) developed by James Martin as the framework for identifying and defining system requirements.

Information Engineering is a comprehensive methodology which uses formal techniques for developing integrated information systems, based on the sharing of common data and procedures. The methodology covers the complete systems development life cycle, from the initial identification of high-level business requirements to the full production of the final system. Using the Information Engineering approach, the ACE Development Team aims to share data between the various offices within Customs and to integrate all Customs information systems.

The Information Engineering methodology breaks the systems development life cycle into stages, each of which has a clearly defined set of IE tasks, techniques, and deliverables. At each stage, further detail is added to the definitions of operational activities, data objects, and the way in which the activities interact with the data. The scope of the system, determined by operational priority and logical interdependence, is reviewed frequently, often at the end of a stage or a major task. This divide-and-conquer approach focuses the development effort on the tasks at hand for better work control and ensures quicker development of priority business requirements.

The ACE development life cycle will also incorporate the "business system implementation" (BSI) concept of IE. Rather than complete every aspect of each development phase before moving to the next phase, which is the traditional "waterfall" approach, the development of ACE will spiral forward on several fronts so that hypotheses can be tested and the results integrated back into prior phases. For example, ACE is moving forward with CDC-2000 as the proposed technical architecture

so that this technical approach can be tested against user requirements collected in subsequent phases. Any inadequacies in the architecture will be identified early in the life cycle and addressed.

All ACE project development teams are using a computer-aided software engineering (CASE) tool from Texas Instruments, the Information Engineering Facility (IEF), to assist in developing the new system. The IEF CASE tool provides a structured environment in which to capture, analyze, and update all of the information required by the Information Engineering methodology. The CASE tool also automatically documents and provides a centralized repository for the information developed and decisions made during each system development stage.

3.0 BASIC REQUIREMENTS INTEGRATION

In the last few years, the quickly-changing international trade environment has forced Customs to assimilate and accommodate important new legislation, administration priorities, the recommendations of oversight agency reports, and changes in global trading practices. In response, Customs established numerous task forces, working groups, and project teams.

By July of this year, more than 35 task-specific headquarters groups were addressing such trade-related issues as the Customs Modernization Act, NAFTA, fines and penalties, trade enforcement, revenue, in-bond, rulings, and many others. With so many diversely-chartered groups engaged in such a wide array of activities, at least some of their effort was likely to be conflicting or duplicative. More importantly, no central focus or framework existed to provide a consistent direction. Fortunately Customs has taken a major step forward to pull these issues together into a clear direction, by naming a process owner for the Trade Compliance process and beginning the endeavor of redesigning the Customs commercial trade processes.

3.1 Trade Compliance Vision -- A Framework for Change

The Trade Compliance Board of Directors has laid out a high-level vision of the Trade Compliance processes which aims to fulfill several important goals. To meet these goals, the Board visualized Customs commercial cargo processing as five interrelated processes: *Service Accounts, Target, Verify, Enforce, and Manage Revenue*; and one critical output: *Report International Trade Statistics*. Figure 3-1 depicts in simple terms the major relationships between these six elements.

The Trade Compliance vision shifts Customs' focus in two key ways:

- 1) by de-emphasizing transaction-by-transaction reviews and moving to analysis of aggregate information in an account-based automated system, and
- 2) by emphasizing voluntary informed compliance.

GOALS OF TRADE COMPLIANCE:

"Maximize trade compliance of trade laws in the top 125 HTS, statistical accuracy, and revenue collection.

Increase efficiency by reducing cycle time, processing increasing workload with current resources, and reducing "exception" processing.

Raise customer satisfaction levels by reducing cycle time, establishing account processing, and emphasizing voluntary informed compliance over "enforced compliance."

Change the Customs culture to support informed compliance by changing the system of rewards to recognize employee efforts in promoting informed compliance."

With an account-based approach, the Board of Directors anticipates that Customs will be able to manage its workload more efficiently by aggregating information to more meaningful levels, facilitating the measuring and tracking of informed compliance, and providing a more meaningful way to fulfill its financial management responsibilities.

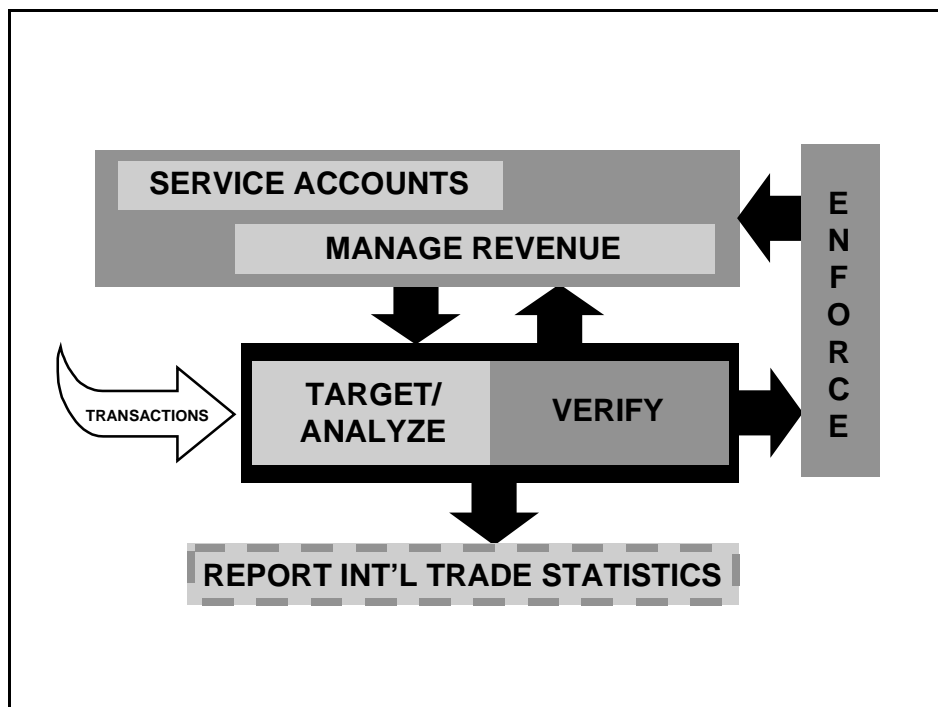


Figure 3-1 The Trade Compliance Processes

Every individual and company conducting commercial trade business with Customs will be set up as a system account at a basic level. This will permit the tracking of all types of account activity, including their trade profiles, compliance levels, financial activity, enforcement actions, etc.

Accounts that meet certain standards will be established as certified accounts. These standards might include such factors as high value, high transaction volume, participation in a pre-importation review, ABI capabilities, and a good compliance rate. The *Service Accounts* PIT will be determining the appropriate certification standards.

As a result of Customs spending more time up front with the account through the certification process, the Board of Directors expects the accounts will be more informed and therefore more in compliance. They also anticipate the need for fewer protests, change liquidations, and penalty actions for certified accounts. In return, a certified account can expect benefits such as fewer cargo exams and data reviews, a reduced bond requirement, variable payment methods, and an assigned account representative. Again, the PITs will determine the exact benefits of certification.

The *Target* and *Verify* processes will occur for many types of Customs transactions, primarily import entries, but also warehouse, drawback, control entries, and potentially others. Accounts, too, will be targeted for audits. To support the *Target* process, ACE will create a single integrated automated targeting system.

For import transactions, the *single entry declaration* will consist of the data that Customs requires for all shipment targeting. The *Verify* process champion is responsible for identifying the specific data elements comprising the single entry declaration and how they will be transmitted and processed, in consultation with Customs users and the trade community.

The Board of Directors envisions that the declaration data for a given importation will be transmitted prior to release of the cargo. But this declaration data need not be received as a single transmission. Using a data stream concept, information about a particular shipment will be transmitted by the parties to the transaction (i.e. carrier, broker, importer, etc.). ACE will compile this declaration information and present to

users a consolidated view of the transaction. When all information needed for a particular process has been received by ACE, processing will occur. Additional incoming information relating to the shipment will simply be added to the transaction record, rather than requiring the same information to be retransmitted an addition time. The single entry declaration approach will eliminate today's need to reconcile different versions of shipment data received at different times (i.e. manifest, entry and entry summary), a need for which Customs has been criticized by various oversight groups. Another important benefit will be the ability to completely target shipments based on consolidated information available in advance of cargo release.

Transactions not targeted will be automatically closed, i.e. released, scheduled for payment and liquidation, payment of drawback claim, etc. Transactions for certified accounts will not generally be targeted for verification (except for routine compliance measurement). Transactions and accounts selected by the *Target* process will be referred to the *Verify* process for examination, data review, or audit, as required. To carry out the verification, supplemental information may need to be submitted by the filer. The results of the *Verify* process can be closure or a referral either to the *Enforce* process for the appropriate enforcement action, or to *Service Accounts* for informed compliance action.

The *Enforce* process entails both the traditional enforcement actions of special agents and those of Fines, Penalties, and Forfeitures. By certifying high volume, low risk accounts, the Board of Directors envisions fewer referrals to the *Enforce* process. Minor problems will be dealt with through informed compliance actions in the *Service Accounts* process. Problems referred to *Enforce*, therefore, should be of higher quality, and represent more meaningful actions. Quality of referrals will be emphasized over quantity. The FP&F process will be streamlined by developing standards for FP&F referrals, emphasizing quality, and by setting realistic penalty guidelines to avoid the current endless loop of penalizing, petitioning, and mitigating.

The *Manage Revenue* process is threaded through the other four processes. It centers around an account based approach, yet all financial information must still be captured, acknowledged, and tracked at the individual transaction basis as well. It also includes the internal controls necessary to ensure the proper management of all revenues received and disbursed.

The Board of Directors recognize that reporting of international trade statistics is an important obligation of the Customs Service. However, it should not require special Customs actions above and beyond its normal operational activities, since accurate, up-to-date trade data is of primary importance to Customs to carry out its trade compliance mission. Therefore, the Board of Directors regard *Report International Trade Statistics* as an automatic *output* of the five Trade Compliance processes, not an actual process itself.

With this high-level conceptual view of Trade Compliance, the Board of Directors has created the necessary strategic framework for redefining, coordinating and managing all Customs commercial trade activities. The ACE Development Team is relying primarily upon this effort to provide the operational direction and requirements that ACE must ultimately support.

3.2 Basic Requirements

This section outlines the basic requirements for each of the ACE-related projects, including AES, and also describes how each project fits into the overall Trade Compliance vision. The work of the Trade Compliance PITs will no doubt alter the more detailed project definitions and requirements, but the projects' high-level goals and objectives should not change.

The basic requirements of Customs Modernization Act-related automation capabilities are also discussed, since these capabilities will be defined, designed and implemented within the framework of the Trade Compliance processes.

3.2.1 Selectivity Redesign

The Selectivity Redesign project consists of three separate, but integrated sets of requirements. These required capabilities, Compliance Measurement, Analytical Targeting, and Trend Analysis, were established to develop and implement uniform compliance measurement procedures for Cargo Release and Entry Summary.

Compliance Measurement determines the statistically valid rate of compliance with established import laws and regulations. This includes, but is not limited to:

- * overall compliance rates;
- * revenue loss, trade statistics, quota; and
- * validity of information provided.

This program will also provide more detailed compliance information on individual components of the measured group, such as importers or manufacturers. Given this enhanced view, specific industry components (commodity, manufacturer, carrier, etc.) can be tracked, measured, and analyzed for compliance and historical trends, and provide insight into how to best target these issues.

Analytical Targeting uses statistically-based commodity profiles to assess potential risks. The analytical targeting system will be rule-based, and uses two concepts called *triggers* and *discriminators*. A trigger is a condition which compares a

data element in a particular entry line to a profile. If the element is not contained in the profile, or deviates greatly from the profile, the entry line will be referred to a Customs official for review. A discriminator operates similarly, although deviation by a discriminator from a profile will not always cause an entry line to be referred for review. Discriminators are used as a scoring mechanism to score entries against a variety of elements. Only those elements whose total score is above an established threshold will be referred for further review.

The Trend Analysis Prototype (TAP) will incorporate Analytical Selectivity and Trend Analysis into a system prototype to test an integrated approach for targeting high risk entry summaries. The selectivity component will help Customs officers identify specific problems on particular high risk summary lines, while the trend analysis component will enable the detection of similar problems in other areas of the industry. Through such an automated tool, Customs officers will be able to see profiles and high-level trends within an industry and identify specific entry summary lines that might be associated with any trends. The prototype will verify the best approach for incorporating trend analysis and transaction-level targeting into a single tool. Eventually, the TAP concepts will be broadened to include other targeting applications.

The Trade Compliance Board of Directors envisions replacing today's manifest, entry and entry summary with a *single entry declaration* filed prior to release. Once the single entry declaration concept has been defined by Customs in conjunction with the trade community, the functional designs for the compliance measurement, analytical targeting, and trend analysis systems will be updated accordingly. A single entry declaration, with supplemental information provided as needed, will greatly streamline the entire import process as well as facilitate the design and implementation of the Selectivity Redesign requirements.

Another key component of the Trade Compliance vision is the development of a single, integrated risk assessment methodology that applies to the full range of Customs commercial activities, not just traditional manifest review, cargo release and entry summary processing. For example, accounts will be targeted for audit based on the trade activity, compliance levels, financial history, and other factors. Risk assessment can also be used to prioritize workload for drawback claims processing, control movements (in-bond), the review of reconciliation entries, conveyances, exports, and potentially many other areas.

The analysis and design being done now by Selectivity Redesign will provide the conceptual foundation for these future capabilities. Each risk assessment subsystem will have its own specific requirements. However, the structure and general capabilities of each will be essentially the same to facilitate the sharing of information between different, but logically related, risk assessment subsystems. One subsystem will be able to use the results of a preceding risk assessment process as part of its risk

assessment criteria. This enables a more comprehensive automated analysis of the total Customs commercial trade workload.

3.2.2 International Trade Data Exchange (INTRADEX)

INTRADEX is chartered to address the International Trade Data System initiative (IT06) of the National Performance Review (NPR). Such a system will support not only U.S. Customs international trade data needs, but also those of other U.S. agencies and our trading partners worldwide. It also holds the potential to serve as an "International Trade Super Highway" -- a gateway to other Customs systems around the world, providing international trade information and shipment status to users world-wide. Currently, INTRADEX is comprised of two major components: a NAFTA automation prototype and the international trade database.

Development of a prototype by the three North American trading partners -- Canada, Mexico and the United States -- has been proposed to test concepts for:

- * standardizing government information requirements and procedures,
- * sharing trade data among the three countries' governments,
- * and facilitating trade through electronic transmission of data.

The scope of the prototype will be limited to certain commodities, participants, and locations. Common data elements and processes have been defined by a working group representing all three governments.

The prototype will test ways of exchanging transaction data among the three governments to eliminate the need for the trade community to transmit the same data multiple times. For example, a Canadian exporter files an electronic export declaration with the Canadian government for a shipment destined for the United States. This information about the incoming importation into the U.S. is automatically shared with U.S. Customs. The U.S. broker would only need to provide any additional data required specifically by the U.S. government. The prototype will help identify and address the many operational, legal and technical issues posed by this type of intergovernmental information exchange.

The second major component of INTRADEX is the development of an integrated international trade information system for collecting and disseminating international trade data through ACE. Such a system will eliminate the need for the trade community to submit duplicate data on multiple forms to different agencies. By providing a single point of contact for all U.S. government activities and requirements concerning international trade, this effort is expected to provide vastly improved service to U.S.

businesses, increase U.S. competitiveness, reduce government burden, and coordinate and streamline government operations. INTRADEX will identify and coordinate the requirements of all federal agencies for trade data. Specific IT-06 task groups on Trade Promotion; Operations; Statistics, Analysis and Reporting; and Licensing and Permitting will develop the overall concept, legal and regulatory issues, budgets and benefits issues, and data processing requirements. The results of this analysis will be consolidated and presented in an IT-06 implementation proposal in early 1995.

The international trade data system fits into the Trade Compliance vision under *Report International Trade Statistics*, in meeting our statutory obligations for supplying trade statistics. It will also be a rich source of information vital for conducting trend and other analyses to support the *Target*, *Verify*, and *Enforce* processes. The full Trade Compliance vision cannot be realized, however, without the full cooperation and participation by all federal agencies involved in international trade; INTRADEX and the IT-06 initiative are the catalysts that will make this happen.

3.2.3 Customs Automated Revenue Accounting (CARA)

The CARA Project was established to redesign the automated revenue accounting processes with the aim of providing better controls over collections and bringing the revenue system into compliance with the Chief Financial Officers (CFO) Act of 1990, recommendations of the General Accounting Office, and the Joint Financial Management Improvement Program (JFMIP) requirements.

CARA conducted an extensive two-year review of twenty-six ACS revenue functions. From that analysis, they identified a number of critical requirements for the *Manage Revenue* process. The revenue system must be designed to recognize revenue at the point that it is earned, rather than waiting to actually receive the revenue. Controls must verify that the revenue reported is the appropriate amount and is, in fact, the revenue received. Financial information must be aggregated and tracked based on accounts, not individual transactions, to allow the generation of accurate and complete financial history reporting of individuals, firms, and agencies with which Customs has a direct business relationship. Instead of individual bills and refunds, account statements will be issued reflecting the account's activity nationwide, potentially on a periodic basis. Electronic capabilities for statement payments and refunds will be expanded. The use of drawdown accounts will be explored and if feasible, appropriate automated accounting procedures will be developed.

The CARA project has recently been folded into the overall Trade Compliance scope under the *Manage Revenue* process, and is also an integral part of the ACE development effort. This will ensure effective linkage of accounting requirements identified by CARA with the Trade Compliance processes now being designed to achieve a fully compliant revenue system.

3.2.4 Automated Export System (AES)

The Automated Export System (AES) will provide a logical migration from today's primarily manual system for export control to an interim automated capability, and ultimately to a system that unifies export and import processing. AES will not simply automate the current forms and processes. The export processes will be entirely re-engineered in parallel with developing the system.

The basic requirements that AES is addressing include:

- * Facilitation of export cargo release in compliance with legal requirements;
- * Targeting and analysis of export trends for enforcement purposes to increase the interdiction of stolen vehicles, currency, chemicals used in chemical and biological warfare, and illegal export of dual use technology;
- * Centralized licensing validation;
- * Harbor Maintenance Fee billing and collection;
- * The collection of data for statistical purposes; and
- * An information gateway for export data required by the Bureau of Census, Bureau of Export Administration, State Department, Office of Foreign Assets Control, and Drug Enforcement Agency.

Carriers will provide manifest data. Exporters, or their designated agents, will provide the declaration data. After the data is validated and stored in the central repository, AES will automatically forward it to the decision agency for action or information.

To ensure consistency and ease of integration, the AES design will include all modes of transportation. However, implementation will be initially limited to exportations by sea, followed by air and then land. Because AES is on a fast development track, it is being built to run using the existing mainframe architecture. AES will ultimately be integrated into ACE by transitioning to CDC-2000 technology and distributed processing.

The Board of Directors essentially excluded exports from the scope of Trade Compliance because of the differences between the import and export processes and the laws governing Customs' responsibilities for them. However, the export process has a number of basic requirements which are consistent with the overall Trade Compliance direction and requirements for ACE, including but not limited to:

- * Establishment of and tracking by accounts;
- * Targeting and analysis capabilities;
- * A standard suite of methods and data syntaxes for interfacing with the trade, government agencies, and the general public;
- * Financial controls and linkages to the revenue accounting system;
- * Collection, extraction and dissemination of data for statistical purposes; and
- * Linkage of export transaction data with any corresponding import data, e.g. drawback, temporary importations under bond, transportation/exportation movements.

As the ACE Development Team develops the system functions to satisfy these basic requirements in the import arena, the eventual integration of AES into ACE will also be a critical part of that process.

3.2.5 Customs Modernization

Informed compliance, the cornerstone of the Customs Modernization Act, requires Customs to completely reevaluate its enforcement responsibilities and relationships with the trade community. The key aspects of informed compliance include:

- * making information about the U.S. government's international trade requirements readily available to the business community and to the public;
- * identifying and publishing the data elements required to be supplied and maintained by the trade community;
- * informing the trade community through such programs as pre-approval and binding rulings;
- * shifting the full burden for proper appraisal and classification from Customs to a shared responsibility with the importer/filer;
- * providing recordkeeping and drawback certification programs; and
- * levying penalties according to more realistic standards.

These concepts radically change many traditional Customs policies and procedures, and will require a significant amount of culture change within Customs, as well as extensive automated support. The Trade Compliance vision provides the framework for Customs to begin this process, primarily by focusing on accounts and in particular, certified accounts. The informed compliance principle will also guide the identification of the data elements required in the single entry declaration.

The Customs Modernization Act gives electronic data the same legal stature as paper documents, paving the way for the filing of protests via ABI, the Automated Surety Interface, and electronic entry and entry summary filing. It also changes many specific processes such as manifest and invoice data requirements, liquidation, and drawback. Many of these changes have already been made in ACS, or are in process. More significant capabilities such as the Automated Surety Interface will be scheduled as part of the ACE development effort.

Several major new capabilities are authorized by the legislation, including remote location filing, reconciliation entries, periodic filing, and the importer activity summary statement (IASS). Both Customs management and the trade community are particularly interested in remote location filing, and have been working over the last several years to flesh out the concept. The basic requirements of remote location filing include allowing filers to file data electronically from remote locations; providing the proper controls for moving cargo to the importer's selected examination location; a workload leveling capability which assigns transactions for review based on commodity expertise and resource availability; and account processing to provide remote filers with a single Customs point of contact. Aspects of remote filing location will be prototyped in the ACS environment, but fully-developed account processing and workload leveling capabilities will be deferred until the implementation of ACE.

The automation of the periodic filing, reconciliation and IASS processes will be done entirely in ACE, although some type of reconciliation prototype may be developed within ACS to address immediate concerns with today's operational practices. Customs is still in the process of working internally and with the trade community (and in the case of periodic filing, the Department of the Treasury) to define the basic requirements for these processes.

3.2.6 The Automated Commercial Environment

The Automated Commercial Environment will be the central integration point for the Selectivity Redesign, INTRADEX, AES, and financial management system projects. ACE will provide the functional and technical components needed by all of the above projects, such as the technical architecture, a Windows graphical user interface, a Customs-wide data base, security, trade and government agency interfaces, and sophisticated analytical capabilities, to name only a few. This approach ensures a

single, integrated automated system that not only meets the widest range of user needs, but is also the most cost-effective to develop.

The ACE Development Team is also identifying, developing, programming and implementing features needed to support Customs commercial trade processing that are not specifically addressed by one of the other ACE-related projects. This involves extensive collaboration with Trade Compliance Board of Directors, the PITs, and the ACS user community. It also requires a thorough analysis of the current ACS to ensure that all required functionality provided now is accommodated in the new system.

Much work still needs to be done to define exactly how the new system will look and function. The next four sections, the Conceptual Overview (4.0), the Information Architecture (5.0), the System Architecture (6.0), and the Technical Architecture (7.0), strive to convey the ACE Development Team's vision of, and direction for, achieving the future Automated Commercial Environment.

4.0 CONCEPTUAL OVERVIEW

Most of the SIMPlan concentrates on the *process* by which ACE will be developed: the approaches, schedules, standards, methodologies, and basic requirements. For a project of this magnitude, this is appropriate at this stage.

As we proceed through the standard development life cycle phases, however, the ACE Development Team is also guided by a vision of how ACE should operate. This conceptual view is not based on a rigorous analysis of user requirements or technical design considerations, but instead represents a general understanding of our users' needs, problems identified in the current system, and the potential of available technology. In this section, we want to share this conceptual view with our users to ensure that we have the right goal in mind.

Trade Compliance Processes: ACE will be designed to support and enable the new Trade Compliance processes.

Account-Based Processing: Through a focus on *accounts*, ACE will provide the Customs Service with a broad perspective of the companies and individuals engaged in international trade, leaving behind today's limited transaction-by-transaction viewpoint.

Single Entry Declaration: ACE will rely on one package of data, a *single entry declaration*, for all entry transaction processes.

User-Oriented Database Design: Unlike today's databases designed to maximize system performance, the ACE database design will be structured around our users' information needs, as represented by Customs business "objects" such as accounts, shipments, entry declarations, targets, exams, collections, referrals, cases, etc. Users will be able to easily find, retrieve, and manipulate the information needed to support their mission activities.

Electronic, Paperless Environment: ACE will be fully automated -- all data and processes will operate electronically. Where incoming data is not automated, ACE will convert this data to electronic form via document imaging, optical character recognition scanning, and/or data entry.

Redesigned Trade Interface: Filers and carriers with automated systems will transmit the entry declaration data and other trade transactions over a standard telecommunications link using industry-standard protocols and formats. For filers and carriers without automated systems:

- * PC-based software will allow creation and transmission of the required entry declaration and other trade transactions; or,

- * Paper forms may be submitted to a contracted data entry facility (for a fee) to convert the data to the ACE electronic format.

International Trade Information System: ACE will serve as the central repository and conduit of international trade information for Customs, the trade community, and federal, state and local government agencies. Trade statistics, import/export requirements, rulings, etc. will be accessible via the Internet or a similar private sector network. Potentially, ACE could also serve as the "International Trade Super Highway:" a gateway to other Customs systems around the world providing international trade information and shipment status to users world-wide.

State-of-the-Art Information Technology: ACE will incorporate the best in information technology solutions, including:

- * An easy-to-use graphical user interface using standard Windows features such as icons, pull down menus, tool bars, and point-and-click operation;
- * New technologies, such as imaging, video/audio capture, remote computing capabilities, and text analyzers;
- * One access mechanism to all Customs automated functions and data from a standard graphical "desktop;"
- * A single, integrated *Customs-wide* database, removing artificial barriers to data access and the need to enter and store data multiple times;
- * A full array of automated tools for trend, statistical and other types of analysis;
- * A distributed hardware and software architecture which places ACE data and processing resources closer to the user, improving response times and providing greater flexibility in manipulating data;
- * Seamless transitioning between ACE applications and local office activities by incorporating commercial office software such as word processing, spreadsheets, presentation graphics, and local databases.

Easy to Expand and Enhance: Although ACE will be fully functional when completed, it will be designed to support enhancements quickly and easily including, where appropriate, the ability for users to add their own features.

5.0 INFORMATION ARCHITECTURE

The primary objective of ACE, as with any automated information system, is the delivery of information to people to support their work processes. In a world of huge volumes of international trade transactions, automation frees Customs officers to spend their time and attention on only those shipments which require it; the system automatically processes the majority of shipments which are routine and low-risk. To address Customs' critical information needs, the ACE Development Team is developing an Information Architecture to serve as the foundation for the System and Technical Architectures, which are described in subsequent sections.

The Information Architecture is presented in three subsections:

- * Section 5.1 describes the Trade Compliance processes and subprocesses in some detail, since these are the Customs work activities which generate the need for information;
- * Section 5.2 summarizes the information needs of these processes; and,
- * Section 5.3 categorizes the information needs into subject areas which are the first step toward developing a database design.

5.1 The Trade Compliance Processes and Subprocesses

The following process and subprocess descriptions are based upon the direction set by the Trade Compliance Board of Directors. Their inclusion here provides a framework for discussing the information needs and subject areas in the Information Architecture, as well as the functional requirements described in the System Architecture (Section 6.3). In the next few months, the Trade Compliance PITs will further define and redesign these processes and associated subprocesses. As a result of this further analysis, these initial descriptions of Customs activities and the lists of information needs will be expanded.

5.1.1 Service Accounts

The *Service Accounts* process establishes and maintains accounts for all customers that conduct Customs business. By using an account-based approach, all Customs activity related to a particular customer can be linked across all its individual transactions. "Customs activity" includes not only trade transactions, but also the associated payments, refunds, protests, drawback claims, voluntary tenders, fines and penalties, etc. Activity among customers (e.g. an importer and his foreign manufacturer) can also be linked, to provide a full picture of trade business. This is a fundamental change from the current practice of transaction-by-transaction processing, as if a transaction was not part of much broader patterns of international trade.

GOAL OF SERVICE ACCOUNTS:

"Establish business relationships with the trade community that: (1) support informed compliance and increase customer satisfaction; and (2) permit the focusing of verification efforts where they will have a greater impact on producing compliance."

Account processing provides a more rational approach to targeting, verification and enforcement based on the account's risk profiles and performance history; minor infractions by accounts that generally comply with trade regulations will be treated less harshly than those by repeat offenders. To ensure the success of the account processing, each account must be assigned a unique, standardized identification number which will be used throughout all Customs trade processes.

Account information will be categorized by profiles. The *Service Accounts* PIT will be analyzing the specific information required in much greater detail. However, the following general types of profiles have been identified, along with a very brief description of the type of information each profile may contain:

<i>Basic Business</i>	Names, addresses, business type
<i>Trade Activity</i>	Transaction volume, value, commodities, countries, business relationships with others (i.e. brokers, carriers, importers, manufacturers, sureties, etc.)
<i>Financial</i>	Current amounts owed to or by Customs for the account, bond data, payment history, payment methods, payment problems, credit/financial information from external data sources
<i>Compliance and Enforcement</i>	Compliance levels, discrepant findings, liquidation history, informed compliance actions, enforcement cases, fines and penalty actions, prior disclosures, financial defaults

<i>Certification</i>	Certification status (including participation in recordkeeping and drawback certification programs), account performance relative to certification standards, account contact information
<i>Outreach/Education</i>	Seminar attendance, pre-classification and binding rulings, internal advice, audits, significant importer reviews, pre-importation reviews, responses to requests for further information
<i>Electronic Data Interchange</i>	ACE access security data, allowable transaction types, interface specific data such as communications profile and data syntax capabilities, transaction error rates upon transmission

Additional profiles may also be necessary based on the account's type of business. For example, a profile for customhouse brokers will include information about licenses, permitted locations, and payment of fees.

The Trade Compliance Board of Directors envisioned that accounts who meet certain standards will be *certified*. The *Service Accounts* PIT will be defining the exact standards for certification and the associated benefits to the account. Through prior review of an account's trade profile, appraisalment and classification methods, compliance levels, financial history and other factors, Customs will verify that the account poses relatively little risk of violating trade laws and regulations. Transactions for a certified account should be in compliance, therefore Customs should be able to perform fewer cargo examinations, change liquidations, protests, fines and penalties, and other exception processing for certified accounts. In general, only shipments targeted for routine compliance examinations will be verified. Another potential benefit of certified status is some form of alternative to the traditional surety bonding requirements, such as reduced bond amounts, letters of credit, and drawdown accounts. Certified accounts will also be assigned a Customs account representative to serve as a point of contact for resolving problems and answering questions as efficiently as possible.

The Customs Modernization Act provides for recordkeeping and drawback certification programs, which are similar in intent and method to the board of director's certified accounts concept. Participation in all three certification programs is voluntary, but is also dependent upon the Customs resources available to certify participants. These issues will be addressed by the PIT.

The seven *Service Accounts* subprocesses have been defined as follows:

Identify Customers and Assess Account Potential:

This subprocess identifies new and current firms, individuals, and agencies with which U.S. Customs conducts international trade business and assesses their account potential. Businesses may be categorized by type (e.g. broker, surety, carrier, etc.), type of industry, number of entries filed, total annual entered value, mode of transportation, geographic area, or other factors as required by users.

Establish and Maintain Accounts:

This subprocess establishes an account record with the appropriate information required by the type of business the account is engaged in (e.g. broker, carrier, warehouse proprietor). The level of bond required to cover Customs' financial risk will be determined. The account's business relationships, activity history, risk, and other profile data will be updated promptly to reflect its transactions and changes in status. This is critical, since account data will be used by *Service Accounts*, the other Trade Compliance processes of *Target*, *Verify*, *Enforce*, *Manage Revenue*, and to a lesser extent, *Report International Trade Statistics*. Virtually all maintenance of account information will be automated, although security considerations will require that certain changes be made directly by authorized Customs personnel.

Certify Accounts:

This subprocess involves all types of certification programs: the board of director's concept of certified accounts, as well as the recordkeeping and drawback certification programs. The account's past performance will be reviewed to verify that the account meets all certification requirements for the specific program. A visit to the account's premises may also be necessary. In the case of certified accounts, some level of pre-importation review will be done of the account's significant commodities and trade patterns. Once the review is completed, a decision will be made and transmitted to the account as to whether the certification has been granted or denied. Certified accounts will be assigned a Customs account representative. All participants in the various certification programs will be evaluated regularly to ensure that their performance continues to meet the standards for certified status.

Provide Customer Support:

In today's environment, the Customs Service must provide quality customer support. Certified accounts will have one point of contact, a Customs account representative, to answer questions and troubleshoot problems. The account representative will work with the account to pre-approve as many shipments as possible to further streamline the process. The account representative will also handle minor compliance violations not requiring penalty or enforcement action.

Educate Customers:

The goal of educating customers is to promote informed compliance and to prevent trade compliance errors. Potential methods for disseminating information and educating accounts include the creation of a national help desk, electronic bulletin boards, Internet availability, interactive public terminals, personal contact, mailings of material, outreach symposiums and seminars. Additionally, regularly scheduled meetings, interviews and visits with accounts will be part of the educational services.

Survey Customer Needs and Measure Satisfaction:

Customers will be surveyed to assess their needs, determine their interest in possible programs, assess the impact of law and regulation changes, and evaluate the results of pilot programs. The survey results will assist Customs in measuring its success in meeting customer requirements and in identifying needed improvements to areas that are not adequately serving customer needs.

Assure Quality of Account Compliance:

This subprocess reviews an account's performance and compliance levels; it also handles minor infractions and provides remedial education on an as-needed basis.

5.1.2 Target

The *Target* process analyzes transaction and account information using a single integrated targeting system.

For transaction targeting, *Target* starts with the receipt, editing, and validation of information filed by the trade. A new *single entry declaration* will be defined to include the information necessary for targeting. The specific data elements are still to be identified, but will likely include much of the data now provided on today's manifest, entry, and entry summary. The declaration data for a given importation will be transmitted prior to

GOAL OF TARGET:

"Increase the reliability of automated targeting and analysis of trade law violations (including contraband) to focus verification efforts on high risk declarations / accounts, to facilitate low risk declarations/accounts, and to minimize the need for judgmental overrides."

release of the cargo. The automated system will review the data for completeness and accuracy, and will reject unacceptable transactions.

The targeting system will match declaration data against targeting rules such as account profiles, criteria, trend data, quota/visa information, other government agency concerns, and compliance measurement sampling factors. If certain conditions are met, the transactions will be targeted for verification. Instructions will be generated for the verifying officers to alert them of the exact conditions requiring verification and a priority-level designation. Transactions not targeted will automatically be closed, i.e. released, marked for liquidation, or otherwise resolved. In all cases, appropriate notices will be generated for Customs personnel and members of the trade community.

This process will replace the current system of targeting transactions based on the review of paper documents. Little or no manual review will be done in the *Target* process, although there will be a mechanism to target based on direct observation of suspicious conditions. All other targeting will be based on defined targeting rules and compliance measurement sampling requirements.

Accounts, too, will be targeted for audits, based on the review of the account profiles, trade activity, and other data. Accounts selected for audit will be referred to *Verify*, which will conduct the actual audit.

Results of the *Target*, *Verify*, and *Enforce* processes will be used to evaluate and modify the targeting rules and compliance measurement sampling requirements to make them as effective as possible and to minimize the need for judgmental overrides. Automated targeting is only as good as the factors that drive it, and these must accurately reflect the risk associated with the target conditions.

The five *Target* subprocesses have been defined as follows:

Receive and Validate Trade Transmission:

Transaction data received through the trade interface will be automatically edited and validated. The trade will be notified whenever a transaction is rejected. If a persistent data quality problem is detected, *Service Accounts* will be notified so that they can work with the filer to prevent rejection of future transactions.

Analyze Trade Transactions and Accounts:

Transaction and account data will be matched against targeting rules such as criteria, account profiles, rules, trend analysis results, compliance measurement samples, as well as other factors such as other government agency requirements, quota restrictions, trade sanctions and merchandise prohibitions.

Determine and Communicate Verification Decision:

This subprocess determines which transactions and accounts require verification, and communicates the decision to the filer and Customs personnel. Resource availability at each location will be factored in the verification assignment to specific sites and personnel.

Release and Liquidate:

This subprocess includes identifying the transaction for cargo release, setting the transaction for liquidation, or holding the transaction for verification. If *Verify* requires additional information, a request for this information will be automatically generated and sent to the filer/carrier via the trade interface. Notification will be sent to the *Verify* process and, where appropriate, to the filer.

Analyze Trends and Assess Targeting Effectiveness:

This subprocess manages the establishment and evaluation of targeting rules using trend analysis and other statistically-based research. Resource availability at each location will also be factored in. Performance reports will be generated to assess targeting effectiveness and to measure compliance levels. The process will provide statistical reports for use by domestic industry and trade community associations.

5.1.3 Verify

The *Verify* process validates the compliance of accounts through examinations, data reviews and audits for the purpose of compiling findings, closing transactions, and possible referrals. The *Verify* process reflects the overall intent of the trade compliance vision to conduct fewer but more comprehensive verifications. cursory examinations or data reviews will be eliminated.

GOAL OF VERIFY:

"To use examinations, data reviews and audits to validate the compliance/non-compliance of accounts, to detect trade violations and to interdict contraband."

Most referrals for verification will be received from the *Target* process, although some will result from other types of analysis or from outside sources. Verification efforts will be focused on high-risk transactions and accounts, and in support of the compliance measurement program. Transactions determined by the *Target* process to be low risk will never be passed to *Verify*, except for routine compliance measurement. Through consistent reporting of all verification results, especially findings of no discrepancies, targeting rules (e.g. criteria, rules, and compliance measurement samples), will be adjusted to minimize ineffective future referrals. In addition to transaction referrals, accounts will be referred for audit verification. Accounts targeted for audit will be ranked so that available resources can be spent on audits likely to yield the greatest results.

The seven *Verify* subprocesses have been defined as follows:

Receive Referrals:

The *Target* process will usually generate the list of referrals for verification processing. This automated list will be prioritized based on the assessment of potential risk, detail the reasons the referred transaction or account was targeted, and serve as the "to do" list for the verifying Customs officer.

Review Initial Data:

The items on the referral list will be reviewed to determine what additional data is needed to verify the issue at hand. The declared data will be compared with the relevant source data, such as invoices, commodity specification sheets, catalogs, certificates, drawback claims, protests, etc. After obtaining all of the requested information, a determination will be made whether additional verification activities are required; whether the transaction or group of transactions will be held for reconciliation, antidumping and/or countervailing duty liquidation orders, etc.; or whether the *Verify* process is complete. If trend analysis data is available, it may be reviewed as part of the initial review process.

Conduct Physical Examinations:

If physical examination of a conveyance or shipment is required, the examination location and the appropriate examination technique will be determined. This subprocess includes the physical examination of the shipment or conveyance, landed quantity verification, and the visual inspection and laboratory analysis of merchandise samples.

Conduct Audits:

Audit referrals will be received from *Target* or may be initiated as a result of another verification activity. Audits will be prioritized so that limited resources can be expended on the highest priority referrals. Preparation required prior to the audit and conducting the audit are part of this subprocess.

Analyze Findings:

Upon completion of the data review and/or examination, the results will be analyzed to determine if the declaration is correct, incorrect, or if further information is needed prior to finalizing the transaction (as when a shipment is held on an admissibility question.) As necessary, a change liquidation will be initiated. If an account has been audited, the results of the audit will be analyzed and the need for further action determined.

Record Verification Results:

Upon completion of the verification activities, results will be entered into the system, including narrative as required. Verification results will include, but not be limited to, discrepant findings, misclassification, incorrect appraisement, a decision to hold, referral to another process, or the fact that no discrepancies were found. If an account audit was conducted, the entire audit report will be entered into the system and available for review. The results of verification will be fed back to *Target* for updating the criteria, and also to *Service Accounts* for updating the account profiles.

Conclude Verification:

After recording the verification results, the *Verify* process will often end with no further action. In some instances, a referral to *Service Accounts* may be sent if contact with a certified account is necessary. A referral to *Enforce* may be sent if an irregularity has been found which requires further enforcement action.

5.1.4 Enforce**GOAL OF ENFORCE:**

"Maximize enforcement results through cohesive pursuit of high impact referrals."

The *Enforce* process reflects the overall intent of the trade compliance vision to provide a balanced informed/enforced compliance approach. Although the trade compliance program will emphasize informed voluntary compliance as the standard, preferred way of doing business, it is recognized that a small minority within the trade community, because of negligence, greed or unlawful intent, requires strong enforcement action to deter them from violations. In defining the *Enforce* process, the Trade Compliance Board of Directors emphasized the following factors:

- * *Consolidated Process:* Enforcement must be viewed as a consolidated process which encompasses fines and penalties, contraband interdiction and special agent investigative activities.

- * ***Fewer, but More Significant, Enforcement Actions:*** The majority of the current liquidated damages, minor penalty and minor seizure cases will, under the new vision, be handled through informed compliance. As a result, the referrals to *Enforce* should be fewer in number, but more significant, more complex and of higher quality. This, in turn, should result in more productive enforcement cases.
- * ***Streamlined Process:*** In addition to expecting better results from the *Enforce* process, the Board of Directors also believes that the process can be significantly streamlined by removing some steps and eliminating delays.
- * ***Seized Property:*** The Board of Directors does not view control of seized property as part of the *Enforce* process or even within the scope of the Trade Compliance mission. They see a clear distinction between working a seizure case (which is part of the *Enforce* process) and handling the inventory control associated with the case (which is an administrative function).

The five *Enforce* subprocesses have been defined as follows:

Log and Assign:

This first subprocess begins with the receipt of a referral from, typically, the *Verify* process, but it could come from another source. After review to ensure that it is valid, the referral is logged in and assigned for appropriate action. Much work is needed to define the criteria for referrals.

Investigation and/or Inquiry:

This subprocess might more accurately be titled Evaluation. It includes the activities necessary to determine the existence and extent of a violation. The depth of inquiry will depend on the nature of the violation, but assuming that most referrals will be significant, document/data review, analysis, physical examination, and preliminary investigation could all be required. This subprocess includes the type of investigation traditionally performed by special agents, as well as other forms of inquiry traditionally performed by inspectors, analysts, import specialists, auditors, etc. These activities will be performed in an integrated way to arrive at a full understanding of the referred incident in the most effective manner.

Review Findings and Report:

The findings from the investigation or inquiry are reviewed to determine the appropriate course of action. If the referred allegation is determined to be unfounded, it will be sent back to the *Verify* process (or other source). If the referral is substantiated but determined to not warrant enforcement action, it will be referred back to *Service Accounts* for informed compliance counseling. If the referral is substantiated and enforcement action is warranted, the appropriate

type of action will be determined. Coordination with the Office of Regulations and Rulings, Chief Counsel, the US Attorney, and other agencies will be a key activity of this subprocess. The determination along with the investigative findings will be recorded and reported.

Take Action:

Customs takes the necessary enforcement action: issuing a penalty notice, seizing merchandise and/or conveyance, proceeding with a formal investigation, etc.

Adjudication:

This subprocess includes all the necessary activities that follow from the enforcement action such as follow-up with the violator, coordination with the seized property process, coordination with the US Attorney's office. The activities will depend on whether the civil or criminal process is involved, the type of action, complexity/severity of the case, etc.

The process ends with closure of the case.

5.1.5 Manage Revenue

The *Manage Revenue* process links accounting requirements with operational processing to achieve a compliant revenue system. It will recognize revenue when it is earned.

GOAL OF MANAGE REVENUE:

"Achieve importer/exporter compliance with Customs revenue assessment and collection processes."

The *Manage Revenue* process relies heavily on the concept of account-based processing. Although financial data must continue to be captured at the individual transaction level, it will be aggregated by accounts so that the total financial picture of each account is readily available. Payments for import/export transactions, additional billings, fines and penalties, refunds and drawback disbursements will all be tracked by account, providing Customs with the "bottom line" of how much is owed by, or perhaps due to, a given account at any point in time.

The *Manage Revenue* PIT will analyze ways to expand the use of electronic means for collecting and refunding revenue, and explore alternative payment methods such as periodic statements and drawdown accounts.

The two *Manage Revenue* subprocesses have been defined as follows:

Acknowledge Revenue:

This subprocess recognizes when revenue has been earned. It also includes the following activities:

- * In conjunction with the *Verify* process, ensure that the reported revenue amount is the true revenue due.
- * Collect the revenue, verify against revenue due and deposit the revenue received.
- * Post collections to appropriate revenue accounts.
- * Take corrective action as needed, such as establishing debit vouchers or imposing sanctions.
- * Account for disbursements and payables, such as refunds and drawback claims.
- * Account for the assessment of additional revenue and ensure that the additional revenue is collected.

Report and Analyze Revenue:

This subprocess provides proper accountability for outstanding receivables and payables, and for the actual revenue collected and deposited. It also includes the following activities:

- * Identify revenue account balances for posting to the general ledger.
- * Reconcile Customs reported deposit/debit voucher information with information reported to Treasury by Customs depositaries.
- * Control the issuance and use of serially-numbered forms.
- * Issue statements by account which identifies all revenue transactions incurred for a specific period and indicates the balance due from or owed to the account.
- * Prepare internal and external reports.
- * Use cost accounting principles to report the cost of the Trade Compliance processes for management information and budget purposes.
- * Perform revenue analysis and projections for congressional, department and management needs.

5.1.6 Report International Trade Statistics

Report International Trade Statistics involves the extraction of statistical data from Customs operational data (including significant corrections), and the reporting of that data to the appropriate agency or party. It is not considered a major process, but rather as an automatic output of the successful operation of the five Trade Compliance processes. However, the Board of Directors recognizes the importance of the trade statistics to the government and the U.S. economy, and therefore has included it in the overall scope of Trade Compliance for their oversight and management.

GOAL OF REPORT INTERNATIONAL TRADE STATISTICS
 "The goal is the collection of accurate and timely international trade statistics through informed compliance, targeting, and verification."

The requirements for gathering and reporting international trade statistics are being developed as part of the National Performance Review (NPR) IT-06 initiative for establishing an international trade data system. This initiative directs the Secretary of the Treasury to establish an integrated database for the collection and dissemination of all international trade data through the expansion and redesign of ACS.

The INTRADEX project team has the lead on the design and development of the international trade data system, in close conjunction with the Automated Export System (AES) for the collection of export statistical data. The ACE Development Team is coordinating with the INTRADEX and AES teams to integrate the IT-06 plans into the development of ACE. The Trade Compliance Board of Directors is responsible for ensuring that the International Trade Data System is compatible with the single entry declaration concept and the new Trade Compliance process designs.

5.2 Critical Information Needs of the Trade Compliance Processes

An Information Need describes a type of information required by Customs to accomplish its mission, achieve its objectives and support its functions. This section presents a preliminary list of the high-level information needs grouped by the five Trade Compliance processes and the one output of *Report International Trade Statistics*. The Information Needs matrix below enables one to easily see which processes need the same or similar information. For simplicity, different descriptions for similar information were combined.

As a result of further analysis both by the Trade Compliance PITs and the ACE Development Team, this list will be expanded and specific data elements will be identified and defined. Analysis will also determine which process maintains the

information, what commonalities (and differences) exist in the way it is described, and how the information will be used.

INFORMATION NEED	DESCRIPTION	S E R V I C E	A C C O U N T S	T A R G E T	V E R I F Y	E N F O R C E	P R E O V E E N C U T E	T S R T A A D T E I S T I C S
Accounts Receivable Aggregate	Aggregate information by account receivable type and class and aging categories.						X	
Activity Alerts	Messages describing system activity related to a referral/case or account, such as new transactions, protests or ruling requests received, contact by the subject or his attorney, or liquidation of entries under investigation.					X		
Bonding Standards	Standard bond requirements for various conditions and types of accounts.	X						
Case Information	The group of information related to a case. This would include the referral information, as well as other data identified, collected and reported throughout the <i>Enforce</i> process.			X		X		
Certification Standards	Conditions that an account has to meet in order to be certified; includes revocation / reinstatement standards, and recertification schedule.	X				X		
Collection	Accounting information relative to payment amounts received, including related revenue accounting codes.					X	X	
Compliance Standards	Specific standards of compliance such as recordkeeping, industry compliance rates, etc.	X	X	X	X	X		

INFORMATION NEED	DESCRIPTION	S E R V I C E	A C C O U N T S	T A R G E T	V E R I F Y	E N F O R C E	P R E O V E N E N C U T E	T S R T A D T E I S T I C S
Customer/Account Basic Information	Data specific to an account such as name, address, business type, certification and trade activity.	X	X	X	X	X	X	
Customer/Account Electronic Data Interchange	Specifics on account electronic data interchange such as ACE access security data, allowable transaction types, interface specific data (e.g. communication profile and data syntax capabilities) and transaction error rates upon transmission.	X	X		X			
Customer/Account Financial Activity and Risk	Includes current amounts owed to or by Customs for the account, bond and surety data, payment methods, payment problems and credit/financial information from external data sources.	X	X	X	X	X	X	
Customer/Account History Information	Historical data on account activity such as verification results, compliance rate, enforcement actions (OE, FP&F, sanctions, etc.) and financial and trade activities.	X	X	X	X	X	X	
Customer/Account Licenses	Specific active import/export licenses and/or permits issued to an account.	X	X	X	X	X		X
Customer/Account Outreach/Education Record	List of training that an account has received such as seminar attendance, pre-classification and binding rulings, audits, pre-importation reviews, etc.	X	X	X	X	X		
Customer/Account Survey Results	Surveys in which the specific customer/account has participated, including the overall results of a particular execution of a survey.	X				X		

INFORMATION NEED	DESCRIPTION	S E R V I C E	A C C O U N T S	T A R G E T	V E R I F Y	E N F O R C E	P R E O V E N I E N C U T E	T S R T A D T E I S T I C S
Customer/Account Trade Risk	Compliance risk based on trade profiles and account history.	X		X	X	X		
Debit Voucher	Information (current and historical) about revenue collection(s) which have been dishonored by depositary(s) (account or aggregate).					X	X	
Declaration Information	Core data describing all of the pertinent details of an import transaction.			X	X	X	X	X
Deposit	An aggregate amount of revenue collected for a specific period and deposited at a designated depositary, including variances (shortage/overage).						X	
Depositary Profile	Name, address, etc and deposit requirements for the specific depositary (bank).					X	X	
Drawback	Request for refund or remission of Customs duties, taxes, or fees.			X	X	X	X	
Enforcement Action Report	A specific report, conforming to legal requirements, describing any enforcement action taken. For example, a penalty notice or a Search/Arrest/Seizure report.					X		
Exam Findings	A recording of the details of the examination, including number and specifics of packages/merchandise examined, type of conveyance examined, discrepancies, etc.			X	X	X		
External Activity	Relevant information generated by activities					X		

INFORMATION NEED	DESCRIPTION	S E R V I C E	A C C O U N T S	T A R G E T	V E R I F Y	E N F O R C E	P R E O V E N E N C U T E	T S R T A D T E I S T I C S
	occurring outside of Customs such as results of the judicial process (indictments, arrests, convictions, acquittals, forfeitures, etc.).							
Harmonized Tariff Schedule of the United States	A system of classifying commodities using internationally agreed upon numeric designations.	X		X	X	X	X	X
Instructions	Standard instructions such as procedures for conducting verifications, special handling instructions (e.g. identification of commodity that is hazardous, requiring special precautions or tools) and instructions related to assignments (priority, sensitivity, etc.).			X	X	X		
Investigative/Inquiry Results	External information from investigations, research, interviews, informant tips, etc., captured and stored in a prescribed format.					X		
Invoice	Commercial document indicating the buyer, seller, commercial description, number of units, price, terms of sale, etc.				X	X		
Licensing Standards	Conditions that a customer must meet to be licensed as a particular type of business (e.g. a broker)	X				X		
Location	Identification of the place where the Customs activity (e.g. verification) will be performed.	X		X	X	X	X	X
Other Agency Information / Requirements	Any information/requirements from other government agencies related to the case or account.	X		X	X	X		X

INFORMATION NEED	DESCRIPTION	S E R V I C E S	T A R G E T	V E R I F Y	E N F O R C E	P R E O V T E E N C U T E	T S R T A D T E I S T I C S
Pre-Importation Review Policy/Program (PIRP)	Definition of PIRPs and how to conduct them under various circumstances.	X			X		
Protests	The legal means whereby importers, consignees, or other designated parties may challenge decisions made by Customs.	X	X	X	X	X	
Rulings	Legal determinations (binding rulings, pre-classifications, etc.) issued to an account by OR&R, NIS/FNIS or the Court of Int'l Trade.	X	X	X	X		
Serially Numbered Forms	Forms used in the over-the-counter collection of revenue for which normally no pre-established revenue receivable exists.					X	
Supporting Documents	Information providing details of a transaction (or block of transactions) such as packing lists complete with marks & numbers, certificates of origin, purchase orders, contracts, catalogs, specification sheets, etc.			X	X		
Targeting Criteria	The specific combination of criteria elements, for a transaction or block of transactions, indicating reason for verification.		X	X	X		
Trade Rules	The collection of all Federal, International, State & Local laws, regulations, and agreements applying to the movement, importation, exportation, or storage of goods, establishing compliance requirements.	X	X	X	X	X	X

INFORMATION NEED	DESCRIPTION	S E R V I C E A C C O U N T S	T A R G E T	V E R I F Y	E N F O R C E	P R E O V T E E N C U T E	T S R T A D T E I S T I C S
Trade Statistics	A collection of trade data, including but not limited to trade transactions, which have been structured to support statistical analysis, policy development, trade promotion, and reporting requirements.		X	X	X		X
Verification Results	The recording of the final results of all verification activities, in a standardized manner, including narrative, if applicable.	X	X	X	X		
Workload	On-going updates on staff assigned to an account, team or case, hours used, and, potentially, funds expended.	X	X	X	X		

5.3 Subject Areas

Subject areas are broad groups of information of interest to an organization. A subject area has a high-level, general description and typically centers around a major resource, product, or activity of an organization. A subject area permits users different views of data. It also clusters related topics or portions of information under a particular subject area. For example, "Enforcement Actions" is a subject area encompassing penalties, sanctions and seizures. Defining subject areas ensures early identification of all information (or data) that is important to and used by Customs. This enables the development of a comprehensive information architecture where every relevant bit of information is considered for possible inclusion in future processing.

Twenty-one subject areas have been identified so far, although more will likely be added as information needs are further identified. The subject area matrix on the

next pages lists the subject areas in the first column, briefly defines each subject area in the second column, and in the third column, gives some examples of the types of information covered by the subject area.

SUBJECT AREA	DEFINITION	INFORMATION EXAMPLE
Accounts	Basic information associated with customers to provide a total picture of their Customs-related activities.	Customer account information, internal information supplied by account (audit), profile & activity information, training & other history
Collections	The receipt of monies from customers via various payment methods.	Duty, tax, user and harbor maintenance fees, collection, deposit
Commodities	Items capable of yielding commercial advantages, whose movement, importation, exportation or storage is of interest to Customs.	Harmonized Tariff Schedule of the United States (HTS), HTS explanatory note
Communications	Information to inform both internal and external customers about trade rules, Customs standards and other relevant topics.	Activity alert, bulletin board message, help, publication, pamphlet, training program, internal message and survey
Conveyances	Vehicles, vessels, aircraft, or other modes of transportation, which are being used or have been used in, or to aid or facilitate, the movement of commodities.	Carrier, manifest, issuer, conveyance mode, port of lading
Countries	Political entities recognized by the U.S. as known nations. Colonies, possessions, or protectorates outside a mother country are considered separate countries. (CFR 134.1 (a))	Trade agreement (bi-lateral), visa requirement, special programs such as Generalized System of Preferences and NAFTA
Customers	Firms, organizations, persons, or other government agencies with which Customs has a business, service or informational relationship.	Unique identification items about customers such as their business name, tax id number, and general business description, survey history
Enforcement Actions	Actions taken to enforce compliance of laws, trade agreements, Customs regulations or other authority.	Case information, enforcement action report, fine, penalty amount, sanctions data, and seizure information
Locations	Sites where foreign and domestic trade activities	Information about ports of

SUBJECT AREA	DEFINITION	INFORMATION EXAMPLE
	of interest to Customs are performed.	entry, warehouses, foreign ports, container exam stations, and foreign trade zones
Performance Measures	The set of quantifiable indicators whereby trade compliance, operational throughput, and processing efficiencies are measured.	Survey result, cycle time
Protests	The legal means whereby importers, consignees, or other designated parties may challenge decisions made by Customs.	Status, decision, filing information, protested issue
Receivables	The proper recording and reporting of revenue-related transactions to support ACE account information with respect to amounts due from customers excluding FP&F amounts	Bill, debit voucher, statement
Resources	People, tools and facilities that are available for Customs operations	Data on skills, hours of operations, workload and operational capabilities by geographic dispersement
Standards	A set of fixed guidelines, procedures and methods used to perform any business function, to establish baseline levels for performance measurements, and to quantify performance indicators to ensure optimum productivity	Bond, certification, & compliance standards, operating procedure, special handling instruction, verification instruction
Supporting Documents	Other data forms and documents used to support the verification of trade transactions	Invoice, purchase order, contract, catalog, commodity specification sheet, certificate of origin
Targeting Rules	The statistics based criteria and rules used to determine which customers and trade transactions require verification	Targeting algorithm, filer information, review type, other government agency requirements
Trade Rules	The collection of all Federal, International, State & Local laws, regulations, and agreements applying to the movement, importation, exportation, or storage of goods, establishing compliance requirements.	Regulation, ruling, agreement, control and statute
Trade Transactions	Declarations/claims of imported or exported commodities potentially subject to duties, taxes, fees, import controls, general public safety, or any trade rules at the time of presentation to Customs	Import Declaration (for entry and in-bond moves), drawback claims, shippers export declaration, manifest/bill-of-lading, and data required for other

SUBJECT AREA	DEFINITION	INFORMATION EXAMPLE
		government agencies
Trade Statistics	The information collected by Customs during the processing of data and execution of procedures	Trade data, port statistics, terminal statistics
Users	The collection of individuals who will utilize the ACE system.	Audit trail information, change history, access authority, user id
Verification Results	The recording of the final results of all verification activities in a standardized manner, including narrative, if applicable.	Audit results, exam and data review findings, declaration discrepancy, laboratory result, quantity verification

The Subject Area Model (Figure 5-2) shows a global view of all the identified subject areas and their relationships. Subject areas are not tied to any single process, although some are tied very directly to particular processes. Relationships between subject areas are depicted by lines connecting one subject area to another. A relationship between two subject areas indicates a logical business or informational connection between them. Some subject areas have relationships distributed throughout the system. For these subject areas, it would be counter-productive to display all the relationships and, thus, they are depicted off to the side.

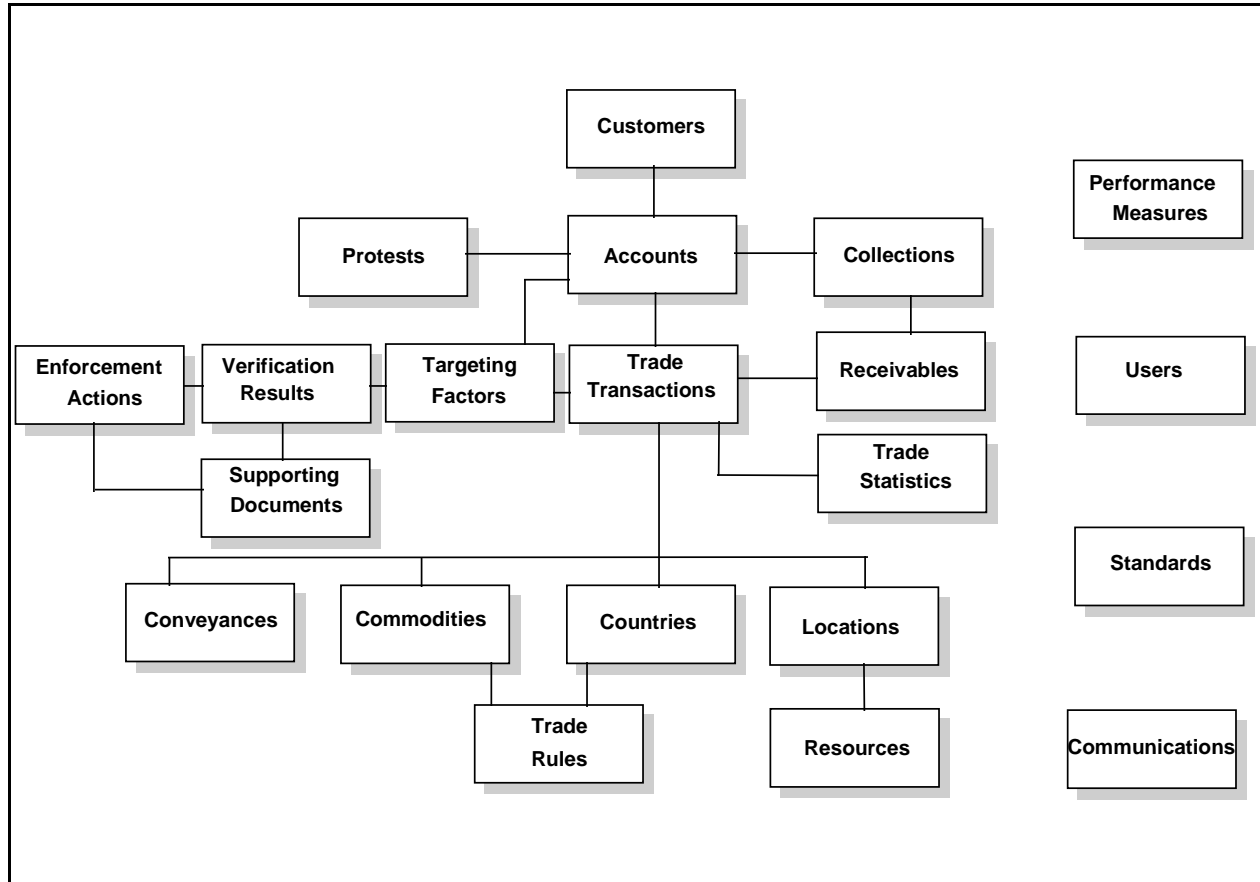


Figure 5-2 Subject Area Model

The model shows too many relationships to describe each one individually. As an example, however, a Customer carries out a Trade Transaction; the activity is tracked at the Customer's Account level, and may be targeted, depending upon the specific targeting rules. Targeted transactions are verified. The Verification Results could lead to Enforcement Actions. Supporting Documentation will confirm the Verification Results and support any Enforcement Action taken.

6.0 SYSTEM ARCHITECTURE

The System Architecture describes how ACE will enable the business processes and satisfy the information needs identified in the Information Architecture (Section 5.0). A model of the ACE System Architecture (Figure 6-1) provides a conceptual view of ACE by identifying the architectural components which will be used to implement the system. ACE will be constructed using the following building blocks:

- * **Interface Components** - the screens by which on-line users interface with the various ACE functions, and the ACE interfaces with the trade community, other government agencies, and the general public;
- * **Business Function Components** - groups of ACE software programs which collectively support a particular operational process or subprocess;
- * **System Function Components** - groups of ACE software programs which collectively satisfy a system-wide requirement; and
- * **Data Components** - the database definitions, data management rules, and ACE software programs which create and access data.

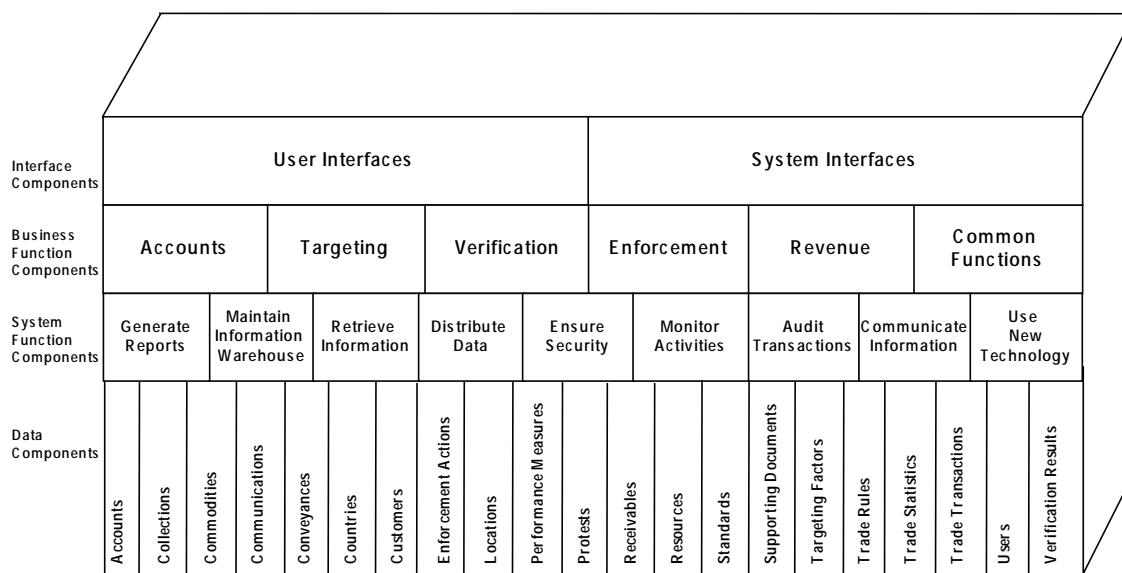


Figure 6-1 ACE System Architecture

The System Architecture also serves as a blueprint for all ACE development activities. As the Trade Compliance subprocesses are further defined, the required ACE components will be identified. The individual components will be assigned to one of the six ACE development teams for completion of definition, design, programming, testing, and implementation activities. During the development process, the ACE Development Team will assess the feasibility of integrating off-the-shelf, industry-standard software. Although detailed requirements are still being defined, it is possible to describe certain characteristics of the ACE components and how they might operate in the CDC-2000 environment.

6.1 Interface Components

ACE will include both interactive user presentation components as well as system-to-system interfaces. The ACE user interface will execute on PC Workstations within the Microsoft Windows environment. ACE will build its external system interfaces using the Distributed Computing Environment (DCE) approach developed by the Open System Foundation (OSF) Incorporated. The various interfaces are described in more detail in the remainder of this section.

6.1.1 User Interface Components

ACE will adhere to the Customs' Graphical User Interface (GUI) design standards to ensure that all software "looks-and-feels" the same as commercially available software packages. Screen and report prototypes will be used extensively throughout the development process to obtain user feedback. The following examples assume a very basic understanding of Windows and have been provided for illustrative purposes only and will change based upon user requirements.

As described in the Technical Architecture (Section 7.0), users will access ACE by signing-on to any local area network (LAN) which is part of the CDC-2000 environment. Once the sign-on information has been processed by the National Security Server, the user's default Program Manager window will display. All ACE functions will be accessed from the ACE Program Group.

Figure 6-2 shows the ACE Program Group of a user who has access to all of the business functions required by the Trade Compliance process. To select a particular function, the user will use his mouse to point and click on the corresponding program group item. In the ACE example, the user has selected the "Verification" function.

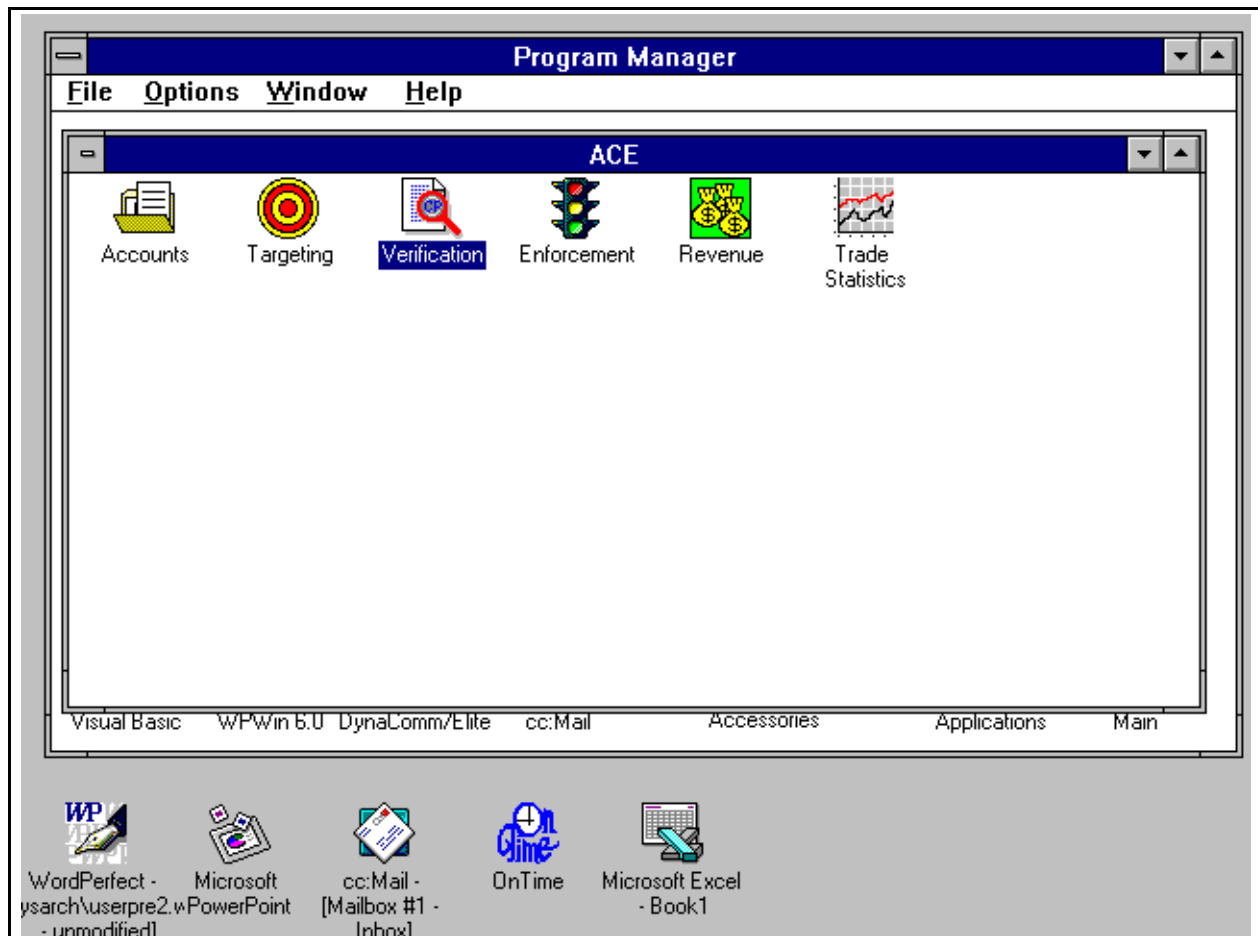


Figure 6-2 ACE Program Group Example

After the user clicks on the "Verification" function, the main function window will display (Figure 6-3). The major components of the screen are the pull down menu and the tool bar. The pull down menu lists all business and system functions available to this user for this process. Users will typically use their mouse to pull down sub menus and then to select a specific function. Users may also select functions without using a mouse by entering commands through a keyboard. Because menu structures may be complex, commonly used functions will also be available as buttons on a tool bar. Although default tool bars will be provided for each business function, users may tailor their tool bar to reflect the most commonly-used functions.

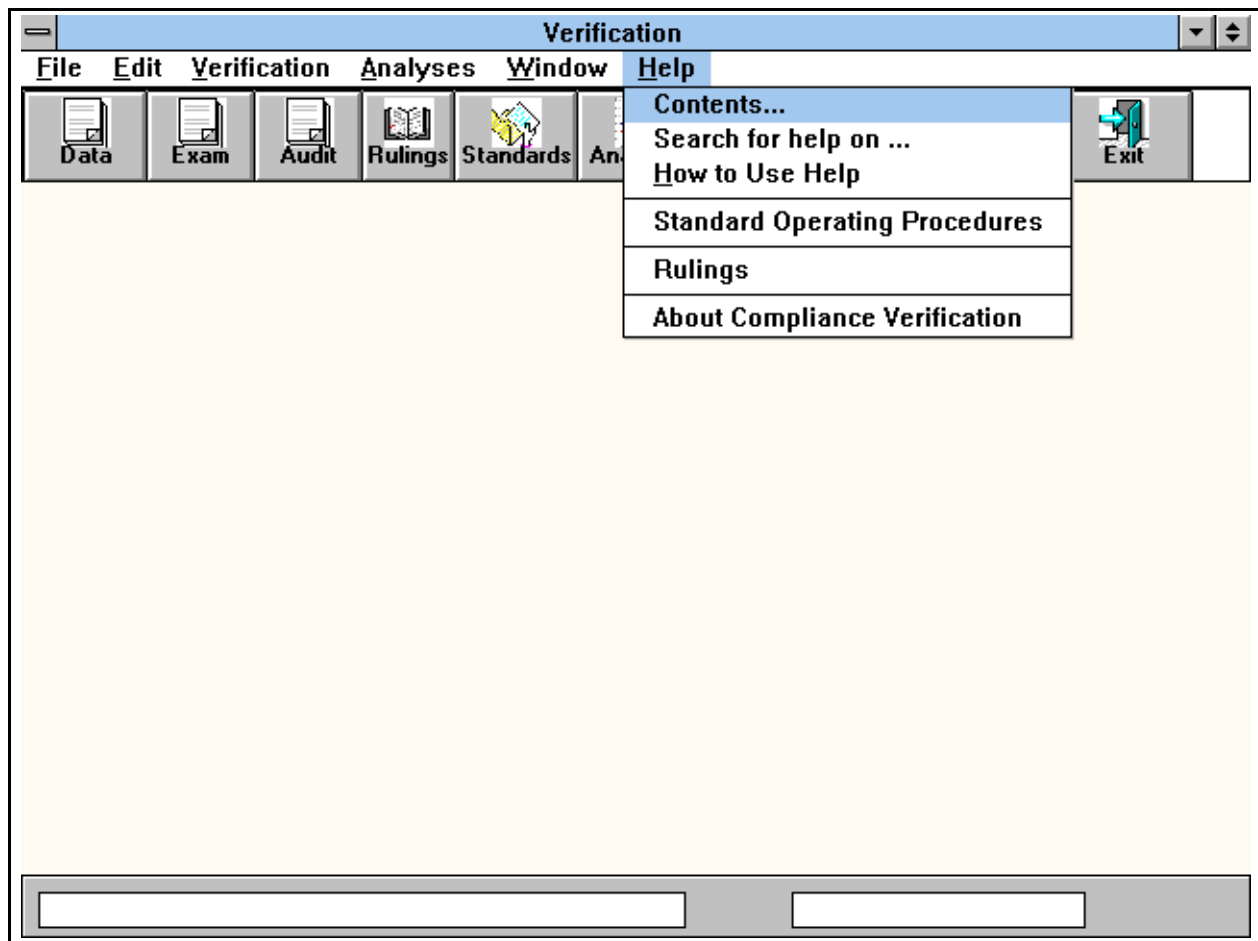


Figure 6-3 ACE Verification Main Function Window Example

When a user clicks on the "Data" tool bar button, the "Data Review List" window opens (Figure 6-4) and the user is able to perform the corresponding business function. Following established GUI standards, all ACE functions will use window "controls" in an appropriate and consistent manner. In the Verification example, a "scrolling list box" control is used to display the pending data reviews. The arrows on the right side of the box indicate that there are more items to view. By clicking on the arrows, the user may move up or down through the list. To view associated detail information, the user either highlights the list item and then clicks on the "Details" button, or simply double-clicks on the item to achieve the same result.

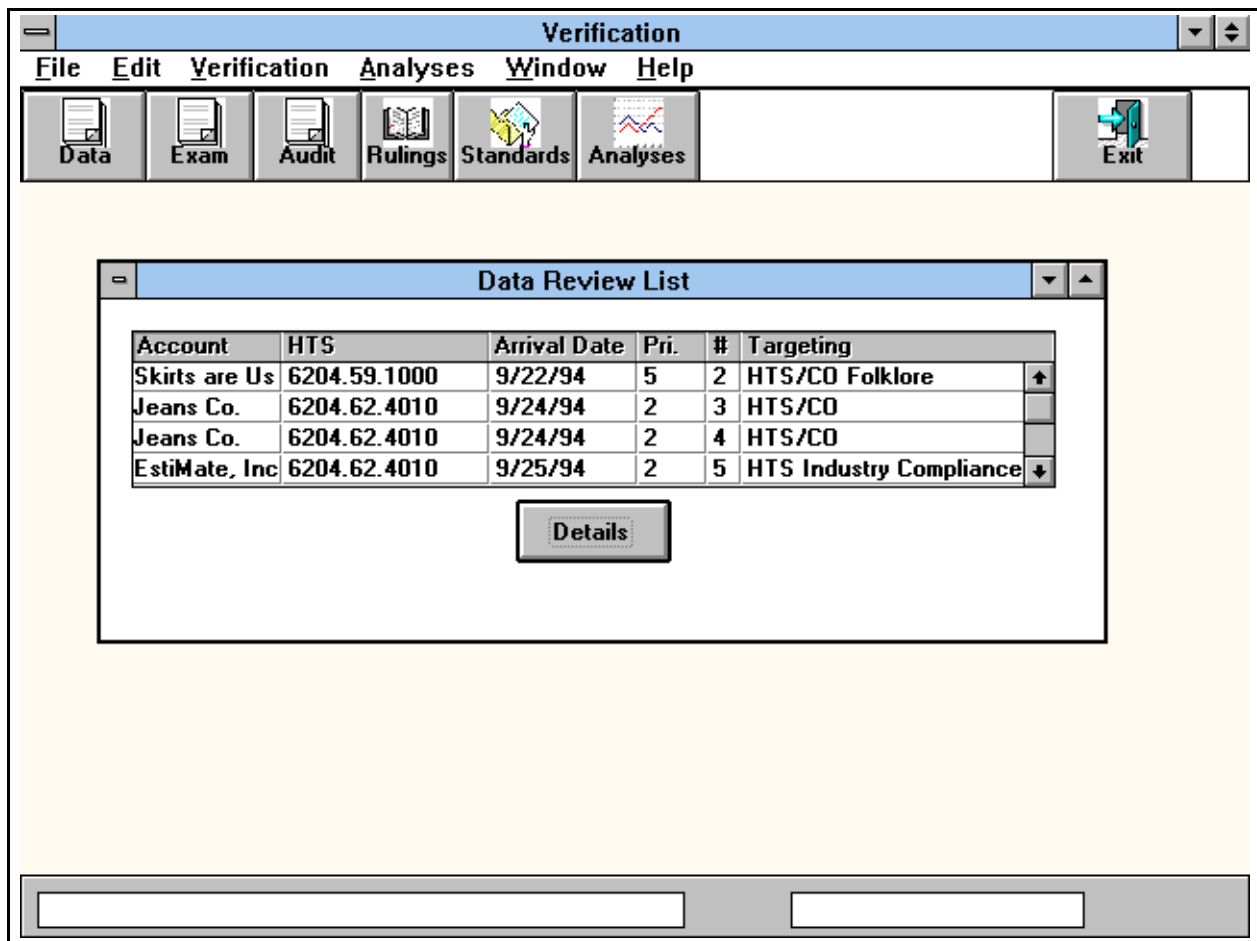


Figure 6-4 ACE Verification Data Review List Window Example

In addition to the help topics and tutorials available through the pull down menus, all ACE windows will have context-sensitive help (Figure 6-5). Whenever a user presses the F1 key, the ACE program will determine the position of the mouse pointer in the active window and will display the corresponding help message. This figure also shows the concept of *hypertext*. Underlined and colored "jump" words indicate that additional help is available on this topic. When a user clicks on a jump word, a secondary help window displays. By using the hypertext feature, users will always have easy access to the appropriate level of help.

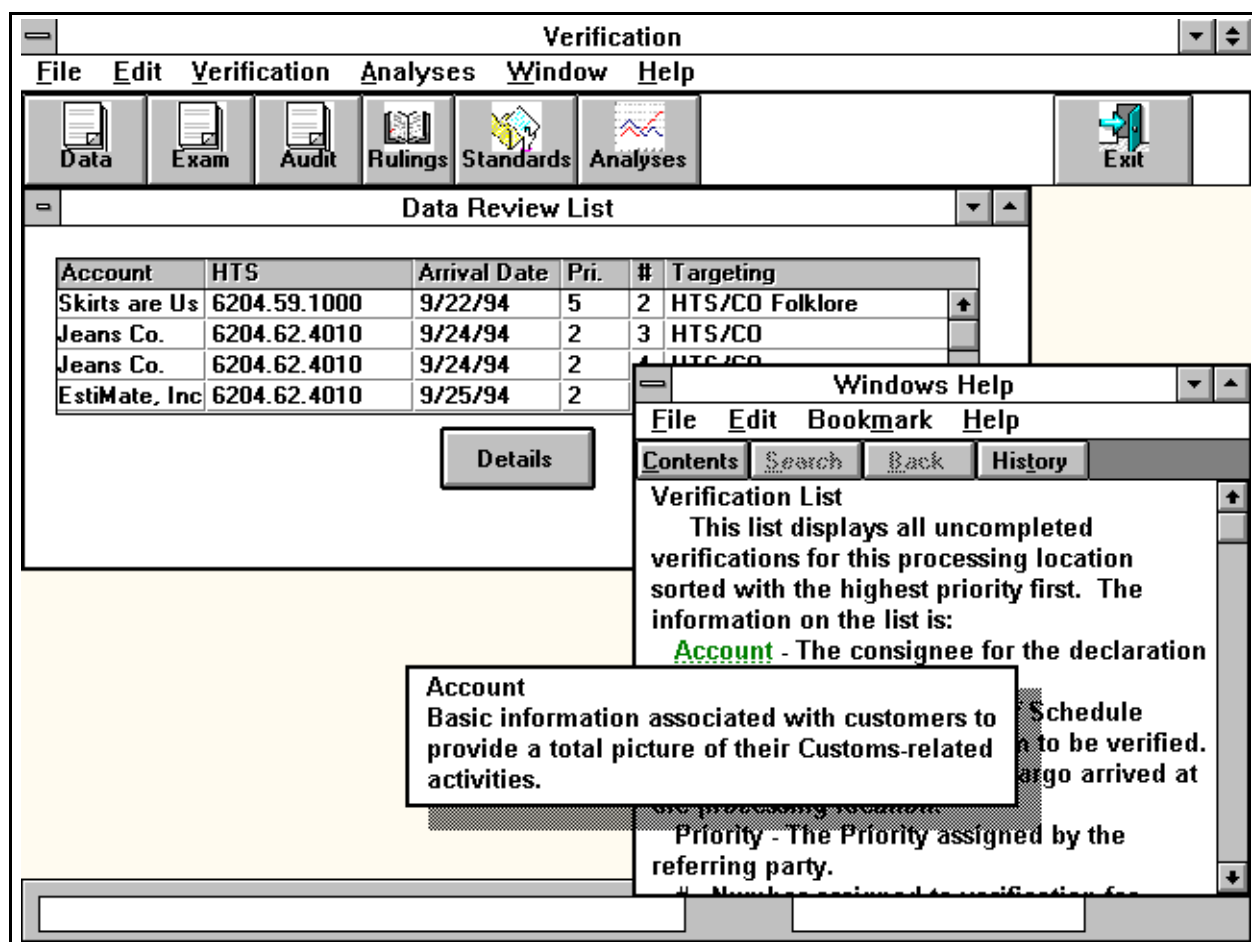


Figure 6-5 ACE Context Sensitive Help Example

One of the most powerful features of Windows is the ability to graphically display and access data. In addition to standard statistical representations, ACE will use maps,

network diagrams, and other forms of visualization. Figure 6-6 illustrates one possible use of 3-D bar charts within a Verification business function.

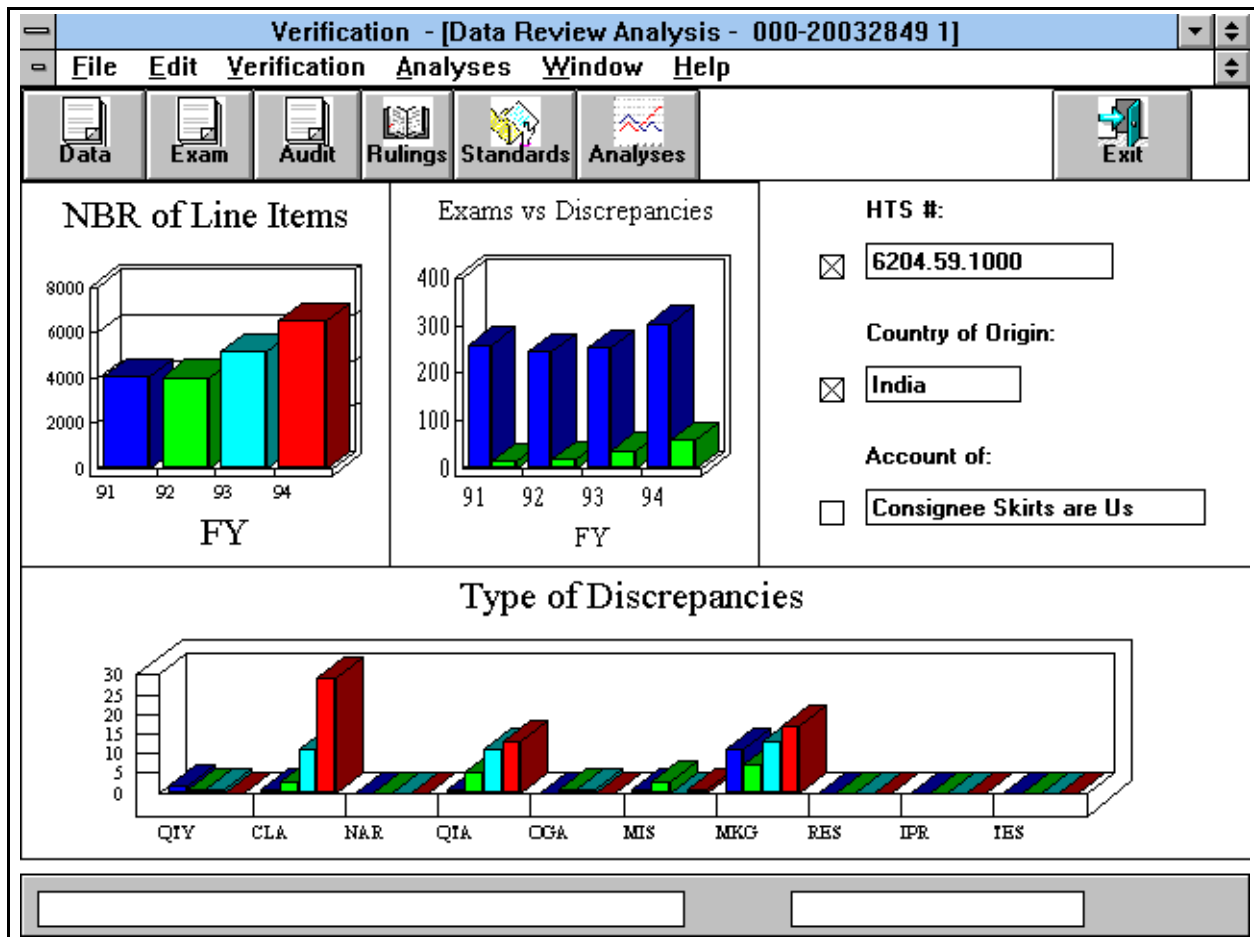


Figure 6-6 ACE Verification Graphics Example

ACE will use the standard Windows printer interface. In addition to supporting standard laser printers, locations may elect to install color printers, plotters, or other specialized printers. Remote line printers will no longer be needed to support ACE business and system functions.

In addition to using the more familiar Windows features, ACE will include images and full action videos as part of the user interface. Word processing, spread sheets, and other office automation products will be seamlessly integrated into ACE presentation components. Future versions of Microsoft Windows will provide additional opportunities for enhancing the ACE user interface.

6.1.2 System Interface Components

One of the mission objectives stated in Customs *Five Year Plan: Framework for the Future* is "to promote a global network that will link all members of the federal government, foreign governments, and the travel/trade community who have need to access Customs information." As prescribed by the National Performance Review IT-06 initiative, ACE will serve as the vehicle for collection and dissemination of international trade data. ACE will implement these information partnerships primarily through system-to-system interfaces with the trade community, government agencies, and other systems. These interfaces will provide real-time, near real-time, and batch access to needed information.

Interfaces with the Trade Community

ACE will streamline communications with the trade community by replacing the existing ACS trade interfaces with a single system that supports transmission of trade transactions, notification of the trade via electronic messages (including FAX), and automated requests for additional data. Standard message formats will be consistently used, with the ultimate goal of standardizing on UN/EDIFACT. The ACE Development Team is working closely with network communication and other specialists to identify the preferred technology solutions for this interface. Customs is currently exploring the use of an electronic data interchange (EDI) gateway. ACE may also include interactive applications to allow non-electronic filers to input trade transactions and perform status queries from a Windows kiosk or a PC located at a public facility.

As discussed in Section 8.6, the trade interface will be developed as part of the first phase of the ACS to ACE transition effort. A redesigned trade interface based upon a single entry declaration will take approximately two years to design, develop, and implement. During this period, the trade community may begin to modify its systems to work with the new interface. To provide the trade with sufficient time to convert its systems, Customs will accept trade transactions via either the ACS or the ACE interface for an additional two year period. Because of the potential cost implications, migration to any new technology will be fully coordinated with the trade community.

Interfaces with Government Agencies

Government agencies will either access ACE through a direct system connection or via the "virtual network" being developed as part of the Treasury Communication System (TCS). The information and processing requirements of federal agencies are being identified as part of the international trade data system described in the IT06 initiative of the National Performance Review (see Section 3.2.2). The ACE Development Team, in conjunction with the INTRADEX staff, will ensure that all

required information is captured via the trade community interface and that other agency processing needs are incorporated into initial system processes when required. In addition to supporting system-to-system data exchanges, ACE will also provide the necessary interactive interfaces with the other government agencies.

Interfaces with Other Systems

ACE will provide easy access information contained in other systems, including the Treasury Enforcement Communications System (TECS), Customs administrative systems, other federal systems, and commercial directories. Users also require that information from other sources be fully integrated with ACE. In a recent ACS User Survey, 62% of the respondents indicated that it is very important to link Customs systems with each other, and with other systems as appropriate. Interfaces with other systems will be identified by the Trade Compliance PITs as they develop detailed functional requirements.

6.2 Business Function Components

To this point, the SIMPlan primarily concentrates on Customs *business*, in the form of the basic operational requirements for ACE and, in particular, the Trade Compliance processes. In Section 6.0, we change to a *system* focus -- Section 6.1 describes the interfaces by which the various users will access to ACE. In this section we attempt to bring the business and system viewpoints together by presenting the types of automated functions for performing operational tasks. These business functions are our projections based on the high-level Trade Compliance vision, initial input from our Field Support Network, and experience with the current system. They will certainly be revised and improved as we work together with our users throughout the development process.

The business functions are organized into six subsections. The first subsection describes the common functions that will be available to all users. These functions will be used slightly differently within each of the process areas to reflect unique operational requirements, but their commonality is important to ensure consistency and communications within and among the process areas. Concepts such as "linking" and "object orientation" provide a cross-process, systems view of how ACE will operate. The remaining five subsections describe the functions unique to each process.

6.2.1 Common Trade Compliance Functions

Notification:

ACE will notify users of relevant system activity. An overt request will trigger some notifications. For example, the appropriate account representative will be notified when a discrepancy found during the *Verify* process is referred for informed compliance. Other notifications will be automatic in nature. For example, *Enforce* users working a case on an account will be able to request notification whenever an action related to that account occurs (e.g., entries, releases, liquidations, etc.) or when a specified targeting criteria hits.

Notification will be "active" to ensure instant communications within and between trade compliance processes. Some type of visual and/or audio signal will alert users when they receive notifications; they will not need to query the system. This active notification might be a message appearing on the screen, perhaps with an accompanying "beep".

Surrogates:

Specific users will be assigned specific responsibilities such as providing data, responding to notifications, resolving discrepancies, and approving the work of others. To ensure that operations continue smoothly when these individuals are unavailable, ACE will include a system of surrogate users who will automatically receive notifications and have authorities to perform functions for these specified users.

Analyzing Data with Integrated Tools:

The CDC-2000 office environment will include software packages for word processing, spreadsheets, local databases, graphic presentations, etc. ACE will also provide users with a fully integrated, comprehensive set of analysis tools to support requests ranging from simple data sorts to complex statistical analyses. Users will not need to exit their normal environment or specially format their data. They will simply select the data to be analyzed and the analytical tool(s) they wish to use to perform the analysis. Users will be able to integrate the results of the analysis into standard ACE reports.

ACE will include options for different skill levels of users. For example, novice users would typically use the standard ACE analytical software options, while more knowledgeable users may choose to store data as a flat file or in a specified database table for further manipulation with other analytical tools.

Measuring Performance:

The availability of accurate and timely performance measures is essential for effective management. Cycle time, defined as *the time it takes for Customs to consume the input and provide an output of the process to the customer*, is one example of a critical efficiency measure. Other possible performance measures include the percentage of examined shipments with negative findings reported or the number of enforcement cases opened during a quarter. ACE processing activities will automatically capture performance measures at the national and local levels, providing Customs Management Centers and port directors information with which to evaluate their performance. ACE will provide a variety of tools for displaying/printing and analyzing this performance data, including graphical techniques.

In close consultation with internal and external users, the ACE Development Team will establish ACE system performance standards based on the newly enhanced system processes and technical architecture; these will be formalized in an updated service-level agreement with ACE users. ACE will constantly and automatically evaluate its own performance against these standards, and alert the appropriate personnel when service drops below a predetermined level.

Quality Assurance:

ACE will support quality assurance as an integral part of process activities. Some of the ways in which this will be applied are described below.

- * *Work Orders* - Several processes involve the assignment of work, e.g., targets for verification, referrals for enforcement, requests for informed compliance action. ACE will incorporate standards for how this work should be carried out, including instructions and the transmission of needed information.
- * *Approvals* - Certain activities will include an automated approval function to ensure that the action will not take place without the necessary supervisory approval. Some examples might include certification of accounts, distribution of an audit report, writing off an overdue receivable, and taking an enforcement action. The approving official will be able to review all of the necessary data with minimum effort.
- * *Edits and Validations* - ACE will include a full set of edits and validations for all information entered into the system. The use of a GUI environment will allow more comprehensive and easy-to-use edits with such features as context-sensitive help, one-field-at-a-time editing, and point-and-click selection of edit table items.

- * *Internal Controls* - The internal controls defined by the PITs will be embedded in the associated ACE functions. Areas of vulnerability, quality standards, and definitions of errors will be established nationally. ACE will select statistically valid samples for internal control review at all levels of commercial processing. Reviewers will enter their review findings directly into ACE. The compiled results will be used for analysis and subsequent adjustments to the work processes. This approach will ensure greater uniformity, make it easier to select samples and report findings, eliminate the need for storing paper backup documentation, associate the quality and integrity review more closely with the work process, and ensure Customs compliance with internal control requirements of the CFO Act and the Federal Managers' Financial Integrity Act.
- * *Ticklers* - The regulations which guide many process activities require that certain actions be performed within specified timeframes. ACE will enforce these requirements with a tickler capability that will alert users when an action is required. After issuing a pre-penalty notice, for example, ACE will start a 30 day clock to notify the case officer when the penalty notice should be issued.

Electronic Signature:

The electronic environment also requires the verification and authentication of data ownership. The ACE Development Team is considering the use of the electronic signature method approved by the National Institute of Science and Technology (NIST).

Managing Resources:

ACE will have a full set of data and features for managing personnel, equipment, facility, and dollar resources. This will include capturing resources as they are expended, presenting the current status of available resources, and providing reports/analyses of resources used in relation to performance measures. The primary purpose of this function is to provide realistic constraints for the assignment of work. For example, the targeting functions must include a check on available verification resources before assigning targets to a particular location. Similarly, knowing the work load of available *Enforce* staff will be critical when prioritizing referrals. In addition to the numbers and hours of available staff, ACE must also provide information on the skills and experience levels of these staff, and the support equipment (e.g., cars, non-intrusive container scanners) needed for the assignment.

Objects:

The "object-oriented" approach to information technology focuses discussions of user requirements and system design on "objects". Objects are the things of importance to an operation. Examples of Trade Compliance objects are: accounts, shipments, entry declarations, targets, examinations, audits, receivables, collections, referrals, and cases. ACE will present these objects to users in a way best suited to the operational function being performed, with easy access to the data and automated tools necessary to the performance of the function. Each Trade Compliance object will have its own set of unique data and tools tailored to the function being performed.

For example, an account representative reviewing an account will:

- * be able to display the basic account information;
- * have immediate access to related account data (such as profiles, history, current status, etc.);
- * have an array of tools for displaying and manipulating the data; and
- * have a set of operational tools for changing the status of the account (certifying it, de-certifying, scheduling informed compliance activities, etc.).

Tracking of Objects:

In addition to data and functions, objects have a life cycle: they begin and end, and they change their status. This aspect allows objects to serve as a means of ensuring cross-process interaction. Although the five Trade Compliance processes define the major work areas within ACE, an object may "live" through all of the processes, with its status changing as different functions are performed on it. For example, a shipment can be the focus of all five processes: it adds to the history of an account; forms the basis for revenue to be collected; provides the input for targeting; could be the subject of an exam; and, might be referred for an enforcement action. Through a variety of ACE tracking and reporting functions, users will be able to know the status of an account, entry, case, etc. at any point in the overall process, and take the appropriate action.

Object Expansion:

Throughout its life, an object expands as actions are taken on it and data is attached. A good example is a declaration targeted for document review which results in a discrepancy, and is referred for enforcement action. Except for its relationship to an account, the declaration is essentially stand-alone when initially filed with Customs. When targeted, it is updated with this status and the details of its assignment for document review. During the document review subprocess, additional data (such as the invoice) and the results of the review are added to the declaration package. The referral for enforcement action results in a change of status and connection to a new object -- the referral.

Finally, the referral leads to another object -- the case -- which, depending on its complexity, can accumulate a tremendous amount of related data and status updates as it moves through the investigative/inquiry, review and adjudication subprocesses ending with a final status of closed. ACE will track the status and maintain the full package of accumulated data so that each user in the processing chain will benefit from previously performed actions and analysis.

Linking:

The expansion described above will result in many objects sharing relationships with the same data. Just as an account relates to the entry transactions for that account, so too does an analysis, an audit, a referral and a case all need to refer to related transactions. ACE will employ a general linking capability to show relationships between data, without the need for duplicating the data. The objects will be the focal points for this linking. Tools for establishing links with related data, and for displaying those links and the related data will be a standard feature in ACE.

6.2.2 Accounts Functions

Listed below are functions that ACE will provide to address the needs of the *Service Accounts* process. Detailed user requirements will identify additional functions needed, as well as determine the specific capabilities of each function.

Accounts:

The primary focus of this process will be **accounts**, which will be a description of a business or group of businesses interacting with Customs for import/export purposes. ACE may have several types of accounts: for tracking trade transactions, for informed compliance servicing, for billing purposes. Accounts are pre-defined, uniquely identified, and designed to serve as a focal point for the accumulation of information. Creating an account will require a certain amount of up-front Customs work to verify the accuracy of the account information. Throughout the *Service Accounts* process, users will access accounts to review status, revise information, analyze performance, schedule informed compliance activities, etc. ACE will present all of the necessary account-related data and tools in a comprehensive, integrated format to facilitate this process.

Businesses:

The *Service Accounts* process, and the other Trade Compliance areas, are also interested in the various trade community **businesses** that may or may not be tracked as accounts. ACE will maintain information on these businesses to support analysis of trade compliance activity: across accounts, in different business areas (e.g., as a broker, as a carrier, as an importer), in relationship to

other businesses, and as sub- or super-ordinate entities within a business (e.g., General Motor's activities vs the activities of its various divisions). While the verification of business information will not be as rigorous as for accounts, the ability to tie activity data to these business entities will only be as good as the quality of this information.

Unique Account Identification:

Uniquely identifying accounts, and preventing duplicate accounts, will be critical to the success of ACE and the Trade Compliance processes. Accounts will be identified by a unique, non-proprietary identifier, which through its structure could convey information about the account (such as business type). More analysis is required to determine the best approach. The chosen identification scheme must allow Customs to legally provide a broad-based account name and address query to the trade community. Internal Revenue Service and Social Security identification numbers could be supplemental account identifiers, but they should not be the primary identifiers as they are today.

Use of External Databases:

To the extent possible, ACE will take advantage of external commercial databases of business information to verify business names, addresses, and type; and to supply additional data, such as financial and credit data.

Account History:

ACE will retain past as well as current account information. When changes to an account's profile or status occurs, a snapshot of the old data must be retained as an audit trail, with the appropriate recording of the date, time, and source of the update. This is primarily how the system will be able to assess account performance. For example, as an account's compliance levels are calculated periodically, the previous compliance levels are retained as well as the updated compliance rate, allowing the compliance history to be tracked over a period of time.

Account Profiles:

Each account will have multiple profiles (basic business, transaction, financial, compliance, education, etc.), but all profiles for a given account will be linked for easy retrieval and analysis. Profiles represent the different categories of information about an account. Some profiles will be relatively static, such as the licenses or permits. Other profiles will constantly change as information is automatically gathered from trade transactions related to the account (e.g., compliance levels, transaction activity and financial account balance). Account representatives will use profiles to easily review specific aspects of an account's activity. To review an account's credit, for example, a user would view the account record and click on the financial profile to see an automated summarization of the account's current balance, bond status, and credit history. Profiles will also have an active aspect: any change requiring immediate action (e.g., drop in compliance levels, bond shortage, enforcement action) will, in addition to updating the profile summary data, cause a notification to be sent to the account representative or other appropriate official to take the necessary action.

Account Certification:

As much as possible, an account's eligibility for certification should be based on objective standards that the system can measure and evaluate. For all accounts, whether uncertified, in the certification process or currently certified, ACE will automatically maintain a certification evaluation based on analysis of account activity in relation to the established standards. An updated evaluation indicator will be a standard part of the account display to alert account representatives of the need for potential action. For certification requirements which cannot be automatically tracked by ACE, account representatives will be able to use an automated decision support feature to take them through the account certification process, and ensure that no steps are overlooked. In addition, it will also provide an electronic record of all the steps taken during the certification process.

6.2.3 Target Functions

The primary function of the *Target* process is to compare incoming transactions against customer account information, compliance measurement considerations, trade profiles, merchandise prohibitions, quota restrictions, trade sanctions, and other government agency requirements. The results of this analysis marks the transaction either for release/liquidation or to be held for verification purposes. Transactions are processed once through the *Target* process. Information derived from the *Target* process updates the customer account information, which includes compliance measurement statistics. Some of the specific ACE functions that will support this process are described below.

Electronic Data:

Targeting is an automated process that will require electronic data. All transactions will be electronic, whether transmitted to Customs via the trade interface, or scanned/keyed into ACE from paper forms.

Editing and Validation:

As described earlier, this is a common ACE function, but it has special importance in this process since it is the entry point for data coming into the system. Transactions are edited and validated early in the *Target* process to be complete and accurate. The specific edits and validations for declaration data are still to be defined based on the exact information requirements. Incomplete and/or inaccurate transactions are rejected and not allowed through the system for further processing. Notification of the rejected transaction is sent electronically to the filer either by the trade interface, or for those filers that submit paper transaction, by FAX. The filer's electronic data interface profile will also be updated, so that *Service Accounts* can work with filers who have persistent data quality problems.

Targeting:

Incoming transactions that pass the initial validation process are accepted as a legitimate declaration and are further analyzed against a set of rules based on several factors:

- * *Criteria:* Does this declaration match specific targeting criteria?
- * *Account profiles:* Do prior violations exist for this account, or has this account been known to traffic illegal substances?
- * *Trend analysis:* Is this declaration consistent with current trends for this account, industry, commodity, manufacturer, etc?
- * *Compliance measurement:* Should this declaration be examined to randomly verify compliance?
- * *Merchandise prohibitions:* Is this a prohibited commodity that should be held or not allowed to enter the country?
- * *Quota restrictions:* Has the quota for this commodity/country been exceeded?
- * *Trade sanctions:* Is there an executive order/embargo prohibiting entry of this commodity/country?
- * *Other government agency requirements:* Are there notification requirements for this product from other government agencies or should a hold be placed on this product?

- * *Resource availability:* Are there enough resources available at the port of entry to adequately verify this declaration, or is verifying this declaration important enough to readjust the existing verification priority?

Artificial Intelligence:

The system will employ artificial intelligence. Each targeting factor will have an associated target-value. As the transaction is evaluated against the targeting rules, the target-value is tallied. Transactions that exceed the target-value limit are marked for verification.

National and Local Targeting:

ACE will incorporate national and local targeting functions. At the national level, targeting will be an automated function with minimal user intervention (except for rule maintenance, discussed below). At the local level, ACE will function more as a support tool. Local users will receive sub-sets of incoming transactions (either on a pre-defined automatic basis or in response to ad hoc requests) which they will then be able to analyze against local criteria, rules and/or data. Local targeting will be in addition to the national targeting and will include local resource availability criteria to avoid conflicts with the resources for national targets.

Target Rule Management:

The targeting rules described above should not be static; they must change based on measures of their effectiveness and as new information is received. ACE will include a comprehensive set of functions for measuring the results achieved from the various targets and updating the rules accordingly. These functions will draw heavily on the compliance measurement data.

Targeting Results:

Transactions targeted for verification will be transmitted to the *Verify* process along with the reason for targeting, the type of verification needed, the priority, and any instructions. Notice will also be sent electronically to the filer with a request for any needed additional data. Transactions that are not selected for verification will be released and marked for liquidation, with notification of the cargo release sent to the appropriate port. The *Manage Revenue* data files will be updated to indicate that revenue is due.

6.2.4 Verify Functions

To support the *Verify* process, the system will process transactions through the *Target* process and pass on targeted transactions for further verification. Many users are concerned whether verifiers will become mere automatons in verifying what the computer selects or whether they will retain discretionary authority to conduct

verifications when they believe they're appropriate. User confidence in the ACE targeting system will increase as it demonstrates an improved ability over current systems to productively target transactions which will yield tangible results or are in support of key Customs initiatives such as compliance measurement and the Trade Enforcement Strategy. In addition, users will retain the ability to initiate verifications independent of the system. The ACE system is a tool in the target compliance process; it is not intended to usurp totally the judgement of the users. Where possible, the factors which lead to productive verifications independent of the system will be analyzed for inclusion in the system so that others may benefit from the judgement.

Listed below are many of the system capabilities that ACE will likely require to address the needs of the *Verify* process.

Target Review and Assignment:

Verification is a resource intensive, time-sensitive process requiring constant attention to tasks and workload. To address this need, ACE will include a function for displaying all targets referred for verification, along with priority, reasons, and instructions, and a parallel display of available staff with their current workload. *Verify* personnel will be able to point and click to select targets and assign them to task. The system will update the workload accordingly, set due dates, and begin tracking the assignment.

Special Instructions:

Referrals for verifications will include instructions, but they may not include the level of detail or particular focus needed by *Verify* personnel. ACE will include the capability to create special instructions that will be indexed to the commodity classification or other salient data in targets. One example would be special handling instructions for hazardous materials. Since not all situations can be pre-defined, ACE will also support the entry of special instructions as part of the assignment function.

Tracking:

Tasks must be tracked through the verification life cycle to ensure that all required steps have been completed. For example, verifications should remain pending until they have been selected or assigned. If it is determined that no verification activity will be performed, this decision must be entered into the system. If examination findings have not been entered, the transaction should not be allowed to be removed from the verification process.

Requesting Additional Information:

When additional information is required for verification, ACE will track who requests this information and the date/time of the request. Upon receiving the information, the system must log it in and provide a receipt (preferably electronic) to the information provider. ACE will track instances of non-compliance (i.e. the information is not provided timely, or at all, or is insufficient) and update the account profile accordingly. This information will be forwarded to the *Service Accounts* and *Enforce* processes for the appropriate follow-up action. In addition to information from filers, ACE will also support access to needed data from external commercial databases.

Capturing Verification Results:

Capturing the results of verification activities quickly, easily and comprehensively is essential for the success of this process. With ACE, reporting verification results will be accomplished through standard input screens using graphical point-and-click techniques and the ability to enter narrative using word processing tools. ACE will capture narrative entry in a manner to support future text queries, including keyword searches. Because of the on-site nature of exam and audit activities, ACE will include portable laptop/notebook type computers with, as needed, cellular access so that verification results can be reported immediately. ACE will also include a video imaging capability for capturing a pictorial view of examination results to document the exam and/or to communicate with remote experts to answer questions on classification and admissibility.

Notification:

ACE will provide an automatic release notification capability upon completion of the verification. Similarly, an automatic notification capability for holds placed on shipments will be supported.

6.2.5 Enforce Functions

From a system viewpoint, the key aspects of the *Enforce* process are referral/case tracking, providing access to relevant information, and interaction with the other process sub-systems. This section describes some of the desired automated features that will support the overall process and some of the new concepts that will be implemented with ACE.

Referral Logging:

The system will need to create an automatic log of internal referrals to the *Enforce* process. The log will automatically date/time stamp referrals to indicate when referred, when received by the *Enforce* team and when assigned for investigation/inquiry. The log will also contain the data describing the referral and the individuals involved in the actions related to it. The log will be easily accessible and displayed as a simple list, or with appropriate statistical breakouts.

Work Assignments:

ACE will include a comprehensive function for assigning referrals and cases. To assign a referral for evaluation, users will be able to call up a window which lists all staff available in the team, their skills, current referral/case load, and their available hours, then select (by point-and-click) the desired team member(s) to make the assignment. This action will update the referral and resource files to show that the assignment has been made, and send notifications to the assignee and to the user/team making the referral. For more complex referrals or cases, this function could include multiple assignees and/or other types of resources such as cars, surveillance devices, etc.

Display:

Users will be able to select referrals, cases and resources from Windows list boxes after specifying appropriate grouping criteria (like specifying the directory when listing word processing documents). The desired object will be displayed in a window with the specific descriptive information (a case, for example, would display with case (number, subject, case officer, dates, etc.) and a list of the information linked to the object. This list will appear in a graphical index format so that users can see the types of related documents/records, identifying data and relationships. Tools will be available for displaying the details of this related information using point-and-click techniques, while continuing to display the full index for navigating back and forth from detail to full object view.

Case Tracking:

Throughout the *Enforce* process, tracking the status of a case, resources expended, information collected, and any results accrued will be a continuous and critical activity. ACE will maintain an up-to-date record of the case with all associated status changes and linked data so that case officers and other authorized users can quickly and easily view the current status of the case. ACE will also include a variety of input screens for reporting status, hours expended, results, and the many types of case-related reports, and linking this information to the case.

Decision Support:

Many of the *Enforce* subprocesses include steps that vary depending on the specific circumstances of a case. ACE will include decision support capabilities, such as decision trees or checklists, to ensure that all necessary steps for a given case are taken and done in the appropriate order.

Investigative/Inquiry Support:

Much of the *Enforce* process involves collecting information through a variety of means, analyzing that information, reporting the information in a standard and legally defined manner, and presenting the information and analysis results in way that will support criminal or civil target being pursued. ACE will support this difficult requirement with efficient access to all of the relevant system information including account data, transaction history, exam results, legal references, prior enforcement actions, and information from external databases. As described in the Common Business Functions, Section 6.2.1, these categories of data will be arrayed in a push-button type display so *Enforce* users can easily determine what data is available and select that which is needed. For non-system data, ACE will include formats for reporting information collected (such as interview results) as well as image/OCR scanning capabilities for hardcopy information (like business records) and capture, storage and playback capabilities for video/audio recordings (such as interviews and electronic intercepts). ACE will also support the linking of both the internally and externally collected data to the case, and integration of this information into prescribed presentation formats, including graphical media as needed.

Link Analysis and Flowcharting:

These are two special capabilities identified by *Enforce* users. Commercially purchased software packages that provide these functions will be integrated into ACE so that *Enforce* users can analyze investigative data using these techniques and incorporate the results of the analysis into required reports.

System Actions:

The notifications discussed in the Common Business Functions section alert users rather than forcing an action. ACE will also allow users to cause actions in other parts of the system, sometimes automatically. For example, at certain points in a case, it may be necessary to set a switch that prevents release of shipments for a specific account or liquidations of entries.

6.2.6 Revenue Functions

ACE will include a full set of revenue functions to support the accounting requirements of the *Manage Revenue* process. The revenue functions will be highly integrated with the subsystems supporting the other Trade Compliance processes. Revenue accounting requirements (such as internal controls) will be incorporated in the

other processes. Data interfaces for exchanging revenue information will be built between all of the processes. Additionally, the ACE revenue functions will interface with the general ledger accounts in the Asset Information Management System (AIMS). Following are the major revenue functions that will be included in ACE.

Account-based processing:

All revenue activity will be posted and retrievable on an account basis. The unique account identification number will be used to link the customers' financial activity to the rest of their business activities with Customs.

Accrued revenue:

ACE will recognize revenue when it is earned. Revenue earned but not yet received will be reported to the general ledger as accrued revenue. The automated revenue system will include this earned revenue on related internal/external reports.

Drawdown account:

This function allows customers to prepay revenue owed to Customs. Two possible approaches are:

- * A retainer-type account in which Customs gets the money in advance from the account via ACH credit processing. The account sends a specified amount to Customs on a pre-set timeframe. The amount sent is based on past business with Customs and is reviewed, and possibly adjusted, on a regular basis. The money received is treated as prepaid revenue until the statement is due, at which time it is recognized as Customs revenue.
- * The account maintains a bank account against which Customs can make ACH requests, similar to today's ACH debit processing.

Revenue verification:

In conjunction with the *Verify* process, this function involves verifying that the reported duties, taxes, fees, and penalties are in fact the correct revenue amounts due and received. Revenue verification also involves a system reconciliation.

Statement processing:

Customers will be sent an electronic statement of all their financial activities for a specific time period. The statements would include the balance forwarded from the most recent statement. Duties, taxes, fees, and penalties owed would be off-set against drawdown payments, certified refunds, and drawback claims to determine the current balance due.

Standardized electronic commerce:

Electronic commerce is the paperless exchange of business information using electronic data interchange (EDI), electronic mail (E-mail), electronic bulletin boards, electronic funds transfer (EFT), and other similar technologies. It involves two-way communication between Customs and the customers using standardized, timely, accurate and reliable transactions.

Financial history:

Past revenue activity will be maintained for user access. The financial history data will be part of the customers' account profile. The financial data could be requested in summary or detail fashion. The on-line request could be for a specific period or an entire account history. The history could be obtained for specific financial activity, such as refunds/drawback claims, duties, taxes, fees, penalties, and debit vouchers. This capability will provide insight into the customers' business activity and relationship with Customs.

Performance measures:

The automated revenue system will provide required/recommended systemic measuring tools to aid management in monitoring specific financial management needs and the effectiveness of the revenue process within the overall Trade Compliance process.

6.3 System Function Components

ACE will include system function components which directly support all business processes. These functions will be implemented as shared components to ensure consistency and promote code reusability. This section briefly describes the system-wide functions identified to date. Additional functions will no doubt be identified as specific business processing requirements are determined.

Generate Reports:

Standard reporting capabilities will be included in all ACE business functions. Certain predefined reports will be prepared on a scheduled basis. These reports will typically be monthly, quarterly, or annual statistical summaries. ACE users will also be able to generate reports upon request, according to user-selected options. Report output will no longer be limited to columnar listings of data printed on green bar computer paper. In addition to text, reports will include matrices and colorful graphics. Report output will be in a "What-You-See-Is-What-You-Get" (WYSIWYG) format. WYSIWYG means that your report will look the same on your screen as it will when it is printed. ACE will include a full array of printers and plotters to produce this output in a variety of media.

Maintain Information Warehouse:

Users require easy access to timely, accurate, and reliable data for analytical and decision support activities. ACE will use an Information Warehouse concept to provide this functionality. To "stock" the information warehouse, selected data elements from the Mainframe operational database will be replicated on a specialized National Analysis Server (see ACE Technical Architecture, Section 7.1). Data will not be simply copied from one platform or storage device to another. The National Analysis Server's relational database structure will differ substantially from the database structure used to support operational activities; the information warehouse will be designed to optimally support analytical activities. The information warehouse will also contain derived data such as totals and averages by location for various time periods.

The development of an information warehouse presents many challenges. Data usage patterns must be observed and analyzed to determine the specific information which needs to be replicated or derived. Data management rules must be developed to ensure that any updates applied to the operational database are also applied to the information warehouse. Update frequency rapidly becomes a system performance issue; user requirements and system capabilities must be carefully analyzed to determine if updates should occur immediately, within minutes, within hours, or according to some other schedule. The ACE Development Team is also exploring the feasibility of distributing the most frequently used portions of the information warehouse to the local Application/Database Servers.

To minimize the risks associated with implementing an information warehouse, the ACE Development Team is meeting with industry specialists. Recognizing lessons learned and employing the best practices of other organizations will help to ensure the success of the ACE Information Warehouse.

Retrieve Information:

ACE will provide a Structured Query Language (SQL) interface with the Information Warehouse. Users will develop queries either by writing SQL statements, or by using a specialized point-and-click GUI application designed for users who are not familiar with SQL commands. This application will include a simple display showing the full set of data categories available for retrieval. In addition to developing customized queries, users will be able to specify basic parameters such as location, commodity, country, and time period to execute predefined queries.

Data retrieved as the result of a query may be distributed, or downloaded, for local analysis. Query results may also serve as an interim step in the data

selection process; SQL queries can be constructed to join intermediate query results with other database tables.

Distribute Data:

As projected in the Technical Architecture (Section 7.0), ACE will operate in a distributed computing environment. Some distribution of data will occur automatically as part of the business functions. At other times, users will want to download information retrieved from the Information Warehouse. On-demand distribution of data must be easy to request and require minimal user intervention. The current data download process, which involves lengthy and complex file transfer procedures, is an unacceptable solution. ACE will include a system function which will support both automatic and on-demand distribution requests. Data downloading will occur as a background task so that users may continue with other system functions during the downloading delay.

Although distributing data provides many benefits, many constraints require it to be a highly controlled process. From a resource perspective, a user should not need to download data already distributed to the local server by a co-worker. However, the two users might have different access control permissions which prevent them from accessing the exact same records. From a legal perspective, the Privacy Act requires that a custodian of records be identified, and the Freedom of Information Act requires that the public be notified of all federal systems of records. Opinions differ as to whether or not downloaded information requires a custodian or constitutes a separate system of records. The ACE Development Team is working with the appropriate parties to address these issues.

Ensure Security:

All ACE components will be developed to operate within the security framework described in Section 7.1.6 of the Technical Architecture. ACE users will only sign-on once; the system will continually verify their access to functions and data. The centralized security approach will allow users to access their desktop environment from any CDC-2000 location.

Monitor Activities:

Customs Internal Affairs (IA) requires the capability to selectively monitor system activities. Upon request, IA agents will be able to view a user's actions from a remote location. They may also elect to turn on monitoring, but have the system save the results for later viewing. This function may also be used by Help Desk personnel to facilitate the resolution of specific user problems. The ACE Development Team is exploring the possibility of purchasing one of several commercially available products providing this functionality within the Windows environment.

Audit Transactions:

ACE will maintain sufficient information to be able to reconstruct an audit trail of changes to any specific trade transaction. ACE will also maintain an audit trail of other predefined security relevant events; the ACE Development Team is working closely with the Office of Information Management's security staff to identify these events.

Communicate Information:

The success of the Trade Compliance processes depends to a great extent on the ability to effectively communicate information to all Customs employees. ACE is exploring ways to add text search capabilities to existing mechanisms such as electronic mail, bulletin boards, and on-line documentation to further facilitate information exchange. It is essential that these and other communication avenues are integrated into all ACE functions.

Accommodate New Technology:

As described in Section 7.3, ACE provides an opportunity to address specific operational issues by applying new technologies. Specialized software will be developed to allow the various technologies to be easily integrated into ACE functions. For example, ACE plans to use a single software product to ensure consistency between all text analysis applications. Additionally, many of the new technologies such as smart-cards, light pens, and mobile computers provide alternative methods to input data into ACE. Special device-dependent programs will accept the input data stream and transform it into a generic, device-independent data format. By using this development approach, ACE functions will be able to process information regardless of how the data was physically input into the system.

6.4 Data Components

Data provides the key to the successful integration of the ACE functional components, since all information consists essentially of data. The information needs and subject areas described in the Information Architecture (Section 5.0) represent a logical, conceptual view of information based on Customs processing requirements. Data components are how information needs and subject areas are defined in the data base as data records or individual data elements, including the associated editing and validation rules, security rules, data disposition, retention, recovery and backup standards. To ensure accuracy and reliability, each type of data will be maintained using a single set of programs. For example, the same "Update Customer" programs will be used whether the update is initiated from the "Accounts" business function or from the "Interface with Trade" system function.

It is essential that accepted, structured data administration principles are practiced throughout the complete life cycle of ACE. Key among these principles are:

- * Data is a resource whose value is increased, rather than decreased, by sharing.
- * Data must be managed and protected as any other resource.
- * Data is defined separately from the technology used to process it.
- * Data accuracy is critical.
- * Data administration guidelines, methods and tools must be uniform and universal.

The ACE Development Team will develop a data management plan in accordance with the Department of the Treasury's Information System Life Cycle standards. The data management plan will ensure that the data in ACE meets operational requirements, facilitate consistent data administration and provide a Customs-wide approach to data administration. It will cover all aspects of data, including:

- * *Life Cycle Analysis:* Life cycle analysis will be used to evaluate the different stages (life cycle) that a data component moves through, from its creation to its deletion (or closure), and what processes affect it in between these two stages. Life cycle analysis also determines what data can be archived and when.
- * *Logical Data Model:* The logical model will concisely and accurately illustrate the data requirements of each functional process and the overall project, and form the foundation for the physical database design. It will also address data elements, their definitions, and the rules governing the creation and usage of data records.
- * *Security:* ACE will comply fully with government security certification guidelines. The security system will be developed and implemented as a common system function used by all ACE programs, not embedded in individual programs. Audit trails will provide additional assurances of security.
- * *Quality Assurance:* Standards for measuring data quality and consistency, as well as the procedures for acceptance test cases, will be established. The organization responsible for monitoring data quality will be identified.

- * *ACS to ACE Data Conversion:* As part of planning the transition from ACS to ACE, a strategy for converting the data will also be developed.
- * *Backup, Archiving, Retention, and Recovery:* Data must be stored as long as it is needed and retrieved as quickly as possible to meet operational needs. Good quality data does not come without cost, however, nor is it inexpensive to support. Ensuring the quality and reliability of data involves knowing which portions of information to store, which components are essential (for disaster planning), and the frequency with which users are likely to need archived data to be restored.
- * *Alternative Data Capture Methods:* Technological innovations, such as imaging and transmission of facsimiles, will allow ACE to expand the types of information that can be easily and cost-effectively captured electronically.
- * *Documentation of Data:* All decisions regarding data and its management will be documented in the Information Engineering Facility tool, and other automated tools as appropriate.

7.0 TECHNICAL ARCHITECTURE

The Technical Architecture proposes the technology components for implementing the ACE System Architecture (Section 6.0). The ACE Technical Architecture is based upon Customs Distributed Computing (CDC-2000) environment. The ACE Development Team believes that CDC-2000 offers the features and flexibility to support the needs of the ACE user community. However, until those needs are known in detail, no commitment to CDC-2000 can be made in the form of major procurement decisions. The Technical Architecture will serve as a model for testing users' requirements against the CDC-2000 approach. Based on the results, informed decisions can then be made about the best technical environment for ACE.

Client-server architectures such as CDC-2000 use the "divide and conquer" theory for providing computing resources. This approach allows one computer (the client) to request services from another computer (the server). Client-server architectures often use several different types of computers; specific processing activities can be distributed to the computer best suited for a particular task. From a user's viewpoint, CDC-2000 technology means that the ACE presentation components will completely change the way in which users interact with the system, as discussed in Section 6.1. CDC-2000 also allows new technology to be applied to ACE business and system functions. From a developer's perspective, CDC-2000 provides many opportunities for improving system operations. However, building and maintaining ACE using a distributed architecture is more complex than using traditional mainframe technology. These issues are addressed in the context of the Technical Architecture.

7.1 Technology Components

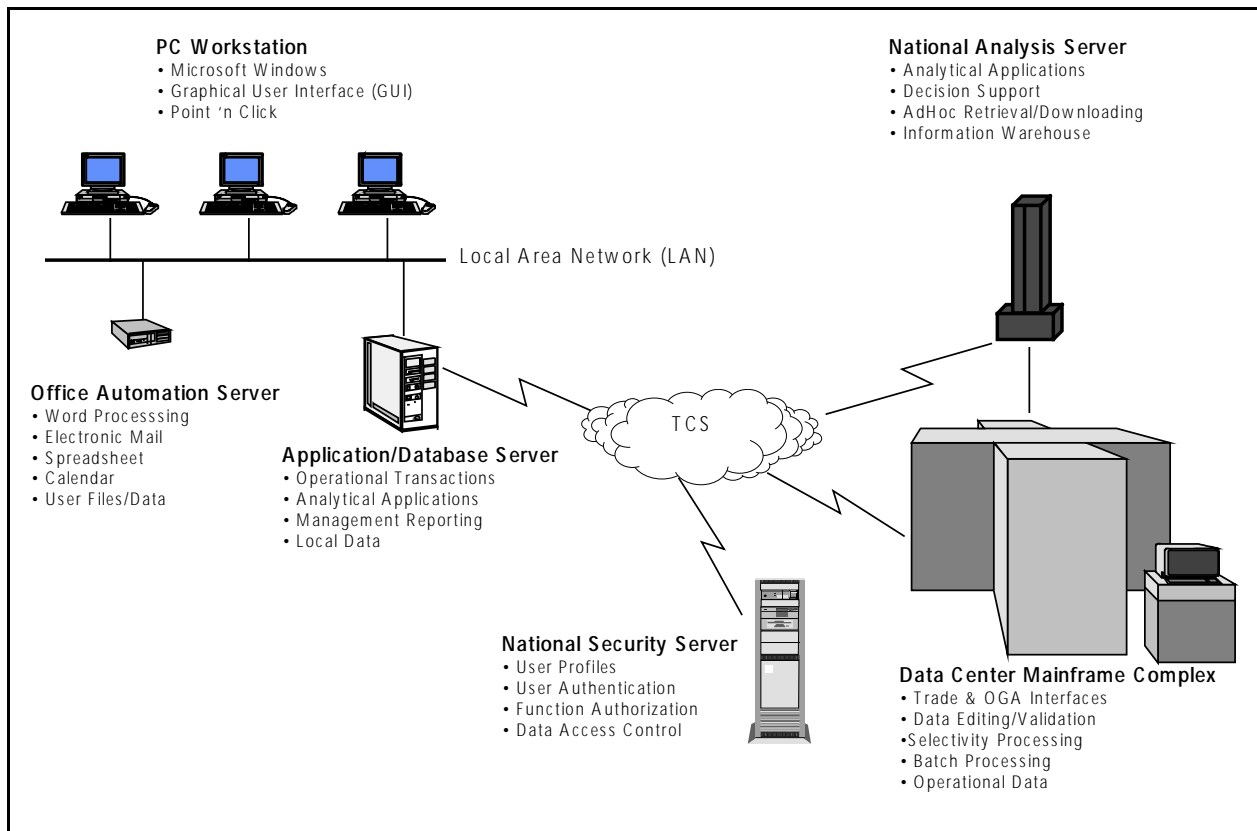
The ACE Technical Architecture is comprised of many individual hardware, software, data, and communication components. To manage this complexity, the architecture is often described as a collection of technology "platforms" which perform specific functions. For example, a Personal Computer (PC) Workstation platform consists of a processor (CPU), a monitor, a keyboard, a mouse, disk drives, cables, an operating system (DOS), an operating environment (Windows), initialization files, software packages, data files, a network interface card, etc. which allow users to interact with the system via a graphical user interface (GUI). A platform-based model of the ACE Technical Architecture is presented in Figure 7-1. ACE will include the following technology components:

- * thousands of PC Workstations (one for each on-line user)
- * hundreds of Office Automation Servers (one or more per location)
- * hundreds of Application/Database Servers (one per location)
- * one Data Center Mainframe Complex (located at Newington, VA)
- * one National Analysis Server (located at Newington, VA)

- * one National Security Server (located at Newington, VA)
- * a massive communications network

7.1.1 PC Workstation

PC Workstations provide users with powerful desktop computing platforms. The workstation includes a large capacity disk drive, enhanced color monitor, mouse, standard keyboard, and a network interface card which connects the PC to a Local Area Network (LAN). Many Customs users already have this type of platform on their



desks.

Figure 7-1 ACE Technical Architecture

Microsoft Corporation's Windows provides a standard GUI for the PC Workstations. ACE users will point and click to access the business and system functions needed to perform their jobs. Context-sensitive *hypertext* help will be available from all functions. All ACE presentation components will adhere to GUI standards established by US Customs. This will ensure that the software developed by the ACE team will "look and feel" the same as purchased software components.

7.1.2 Office Automation Server

The Office Automation Server is a PC designed to provide users with access to standard word processing, electronic mail, spreadsheet, database, and calendar software packages as well as to individual files and data. Any PC software developed by ACE will also reside on the Office Automation Server and will be retrieved as needed for execution in the desktop environment. Local system administrators will be responsible for ensuring proper software management, back-up and recovery, and LAN administration. This approach to system administration requires that additional staff resources be assigned to each location.

Many locations already have Office Automation Servers. These sites currently use local servers to access existing mainframe-based interactive applications using NSA's Dynacomm Elite product. Dynacomm Elite allows character-based screens (green text on a black background) to operate within a window. All ACE applications will use a Windows user interface; Dynacomm Elite will only be used during the transition from ACS to ACE.

7.1.3 Application/Database Server

The Application/Database Server is a powerful UNIX platform which can be tailored to the distributing processing requirements of each location. This platform uses the UNIX Operating System which provides a robust multi-user, multi-tasking architecture. Distributed data will be stored on the Application/Database Server using Oracle Corporation's Oracle relational database product. Application/Database Servers will also be maintained by local system administrators.

Distributing functions and data to the local level provides a faster response to the user and minimizes the impact on the communications network. However, many other factors, including cost considerations, play a role in determining whether or not to distribute. From a user's perspective, it does not matter where the processing takes place or where the data resides because the ACE software programs will address these issues. Please refer to Section 7.2 for a more detailed explanation of distributed computing issues.

7.1.4 Data Center Mainframe Complex

The Data Center Complex is a collection of mainframes with many disk drives, disk controllers, and tape drives. The mainframes use IBM's MVS operating system. Computer Associate's Datacom/DB is used to manage Customs data. The existing mainframe equipment configuration will continue to play a significant role in the processing of ACE-developed functions, especially in the operation of interfaces with

the trade and government agencies. Additional systems software products may be required to support CDC-2000 processing activities.

Although hardware-related changes required by ACE will be minimal, the mainframe-based application software changes will be extensive. All existing ACS interactive character-based applications will be replaced with ACE programs which use GUIs. Many of the batch ACS programs will also be replaced. Nearly all of the Datacom/DB database tables will likely be redesigned to support ACE data processing requirements.

7.1.5 National Analysis Server

Existing Customs information systems do not provide adequate support for analytical activities. ACE will provide a comprehensive solution to this problem. The National Analysis Server will be a specialized computer designed to support complex and resource-intensive analytical functions. This platform will also serve as the Customs Information Warehouse, supporting management reporting as well as on-demand data retrieval and downloading.

A specific hardware platform has not yet been selected for the National Analysis Server. The identification of specific analytical requirements remains an especially challenging task. Once processing requirements have been determined, alternative hardware options will be evaluated. The Automated Targeting System (ATS) project is currently using an IBM RISC-based high performance parallel processor computer, a model SP/2. If the SP/2 can satisfy the ACE analytical requirements, it will probably be selected as the National Analysis Server platform.

7.1.6 National Security Server

Ensuring the security of automated information systems is a critical and complex task, even in a centralized computing environment. The ACE Development Team is working closely with the Office of Information and Technology's security staff to develop a comprehensive Security Management Plan specifically addressing the distributing computing aspects.

A preliminary decision has been made to use the Kerberos approach. Kerberos is a software-based solution designed by the Massachusetts Institute of Technology and under development by the Open Systems Foundation. The computer industry has identified this approach as one of the most viable security solutions for distributed systems. Essentially, the Kerberos approach uses a National Security Server to maintain a centralized file of security profiles. All of a user's access permissions will be stored in one place, eliminating competing versions of the data. Although a centralized security staff will maintain the profiles, it may be desirable to

allow properly authorized local administrators to assign users to certain basic access groups.

Users will only need to login into the system once; the National Security Server will continually verify a user's access to functions and data. A centralized security system will also allow users to login to the CDC-2000 network from any Customs location and still maintain access to their desktop environment.

7.1.7 Communications

ACE will use the Treasury Communications System (TCS) for all wide area network (WAN) communications. TCS is a planned replacement of the Consolidated Data Network (CDN). Novell Incorporated's networking products will continue as the standard for LAN communications. ACE programs will communicate using a combination of network protocols including Novell's IPX/SPX (Internet Packet Exchange/Sequenced Packet Exchange), TCP/IP (Transmission Control Protocol/Internet Protocol), and IBM's APPC/LU6.2 (Advanced Program-to-Program Communication/Logical Unit 6.2). As described in Section 7.2, ensuring optimal network performance is one of the greatest technical challenges for ACE.

7.2 Distributed Computing Issues

While the CDC-2000 architecture offers many advantages, it also raises many distributed computing issues which must be resolved. Section 7.1.6 identified some of the challenges involved in managing security in a distributed environment. Another significant issue is how to distribute new software releases to the hundreds of Office Automation and Application/Database Servers. The ACE Development Team is working closely with the CDC-2000 technical working group to address these and other issues.

The ACE Development Team must decide how to distribute processing and data across the various ACE technology components as part of functional requirements analysis (FY 1995). This decision will have long-term performance and cost implications. Performance and cost factors must be quantified and modeled for each component of the System Architecture (presentation, business functions, system functions, data) as it applies to specific components of the Technical Architecture. This model will aid the ACE Development Team in deciding which computing platform can host which processing and data for the best performance at the least continuing cost. The model must also factor in resource limits such as network bandwidth, platform processing power, and data storage capacity.

The ACE distribution model will consist of two parts. The first will describe the optimal distribution of data across the Data Center Mainframes, the National Analysis

Server, and the local Application/Database Servers. The model will consider such factors as:

- * the degree that the data will be accessed locally or nationally,
- * the size of the database relative to the capacity of the platform,
- * the associated replication and update costs, and
- * the corresponding data administration costs.

For example, data editing and validation tables are national in scope, but all locations need access to the data. Most of the tables are relatively small in size. The tables periodically change, but typically not on a daily basis. Even without a quantitative assessment, it appears that edit tables are candidates for replication on the local Application/Database Servers.

Data used for operational functions will *not* be distributed to the PC Workstations. This decision was made based upon the limited disk capacity of the PC and the significant data and security administration issues which would result. However, in certain situations users may need to locate specific subsets of data on their workstations to conduct detailed analysis. This capability will be supported by the Retrieve Information, Distribute Data, and Analyze Data system function components described in Section 6.3.

To determine which components will execute on the Data Center Mainframe, the National Analysis Server, the Application/Database Server, and the PC Workstation, the second part of the ACE distribution model will examine processing-related factors including:

- * transaction volumes,
- * end-user response times,
- * performance requirements,
- * unique processing requirements, and
- * specific cost factors.

For example, the decision to place ACE presentation components on PC Workstations was made because PC platforms support the unique processing requirements of a graphical user interface in the most cost effective manner.

Once the ACE distribution model is complete, it will be carefully reviewed and other factors such as ease of implementation must be considered. In addition to guiding ACE development activities, the refined model will also serve as the basis for capacity planning efforts.

7.3 Applied Technology

A primary objective of the CDC-2000 strategy is to build an architecture capable of easily accommodating new technologies. The use of standardized platforms allows ACE to apply these technologies to specific business and system functions. Figure 7-2 identifies some of the technologies which have potential application to ACE.

Many of the technologies are not very new at all. Private industry has used these technology-based solutions for many years. Customs has sponsored many pilot projects which demonstrated the effectiveness of using technology to solve specific operational problems. The ACE approach differs by applying technology as an integral part of the automated system.

Identification:

Identifying cargo and conveyances electronically is a high priority in Customs today. Cargo, conveyances, and other items can be identified using bar code technology. Another identification method is using transponders located on the conveyance. A computer activates the transponder via a radio signal; in turn, the transponder returns conveyance and cargo information to the computer. These technologies have the greatest potential at the land borders, where transmission of transaction data through the trade interfaces may be impractical.

Authentication:

Who are you and how can I be sure? Biometrics, using physical measurements to identify a person or verify a signature, is one method. Typical biometrics are fingerprint, hand geometry, electronic signature, and voice recognition. For example, the ACE Development Team is investigating the use of the recently approved National Institute of Standards and Technology (NIST) electronic signature standard for regulating serial numbered forms, decals, and other controlled documents. Other technology such as "smart cards," a credit card-sized computer with information about the owner, can help answer the "who are you" question.

Artificial Intelligence:

Artificial Intelligence (AI) is one of the most promising, yet complex technologies that ACE will employ. ACE targeting functions will extensively use rule-based *expert systems* and *neural network* concepts. Expert systems replicate the human decision making process by automating definable rules. The computer uses feedback on the results of its decisions to improve future performance by adjusting the decision making rules. The neural network concept is that a computer can learn from its own actions. The Automated Targeting System (ATS) has successfully applied this technology to manifest targeting. ACE will build upon the ATS' success and apply AI techniques to other types of data.

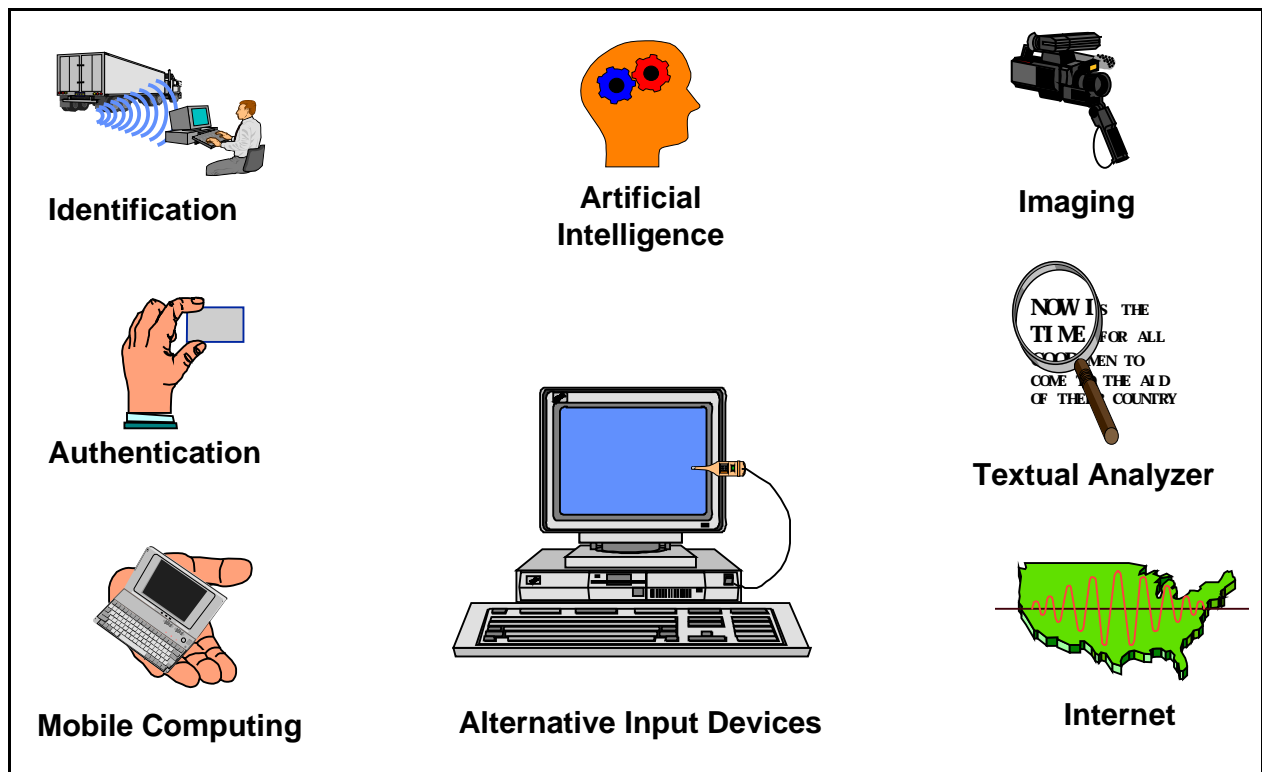


Figure 7-2 ACE Applied Technologies

Imaging:

"A picture is worth a thousand words." The ability to see the item, instead of imagining what it looks like from a description, greatly reduces perception errors. TECS and the ACS Intellectual Property Rights module already incorporate photographic images. Several pilot projects are testing the potential of document imaging technology. ACE is developing a prototype which allows action videos to be played within a graphical user interface. Users will be able to cut and paste frames from the video window into a word processing or other document.

Textual Analyzer:

You have just learned that many of the Harmonized tariff rulings in your commodity line have been extensively updated, and you need to know how it impacts your day-to-day work. Textual analyzers with hypertext is the answer. These analyzers can be very sophisticated, using artificial intelligence, grammar

rules, and hardware modifications to reduce large volumes of text into ready-to-use information in seconds. On a user's screen, hypertext (typically underlined text) indicates that more information is available on the word or subject. Clicking on the text with the mouse reveals more information about that topic. In the Rulings Packet example, clicking on the words synthetic monofilament might provide the associated harmonized tariff classification number, 5404.90.0000.

Mobile Computing:

You are conducting a field audit; you take notes, get signatures, and record results. Returning to your office, you enter your audit findings into your desktop computer. With mobile computing, however, you can skip the trip to the office. Mobile computing allows you to communicate with the system from virtually anywhere, using devices such as notebook-sized computers with high-speed modems and simple telephone lines or even cellular connections.

Alternative Input Devices:

You are crawling through a trailer, examining a targeted land border shipment. Using voice recognition technology installed on your hand-held computer, you verbally inform ACE of your findings. Voice technology can now reliably recognize a limited vocabulary for a specific individual. Older technologies, such as light pens or touch screens, can serve as alternative input devices when using a mouse or keyboard is not desirable or practical.

Internet:

Internet has become the preferred communication method of the 1990s. ACE will use Internet to exchange public information with the business community, trade groups, and the general public. The existing Customs Electronic Bulletin Board (CEBB) will be available through Internet, as will publications such as *Importing into the U.S.* and *Know Before You Go*. Due to security, legal, and other considerations, Internet will not replace the trade interfaces, which will continue to be used for the transmission of trade transaction data.

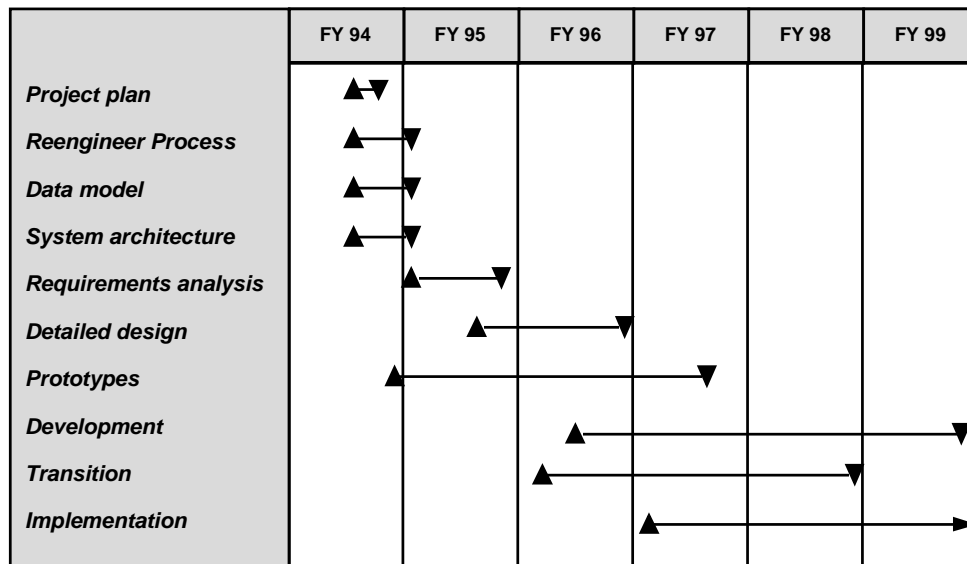
8.0 IMPLEMENTATION AND TRANSITION

As would be expected for a project of this magnitude, the development and implementation cycles for ACE will be lengthy. ACE is not an ACS enhancement, but is a total redesign of the current system and will require much up-front requirements definition and design. In essence, the system will be built from the ground up. Since the operational requirements for ACE will be based on a new way of doing business in Customs (the trade compliance vision described earlier), this up-front time will be critical for ensuring close coordination with the teams designing the new trade compliance processes. The technology base for ACE is also new. The system will be built to operate in the CDC-2000 environment which departs from our traditional mainframe approach through the capability to distribute data and/or processing, a client/server architecture, and a graphical user interface. These factors all require a significant time investment to ensure that ACE delivers the expected service.

Of particular importance to the ACE development plan is the preparation of system users for implementation of the new system. Although Customs has had great success in building large-scale computer systems, our users have often suffered through a painful implementation process because of inadequate preparation, limited training, and flaws in the delivered software. For this reason, the ACE schedule includes a lengthy implementation phase to prepare users and to thoroughly test the system **before** it is made operational.

Of equal importance is the transition from the current ACS. From both the technical and user impact viewpoints, this transition must be well-defined and smoothly carried out. Further, the current ACS staff and the hardware, software and data which support the system are valuable assets which must be dovetailed into the development of the new system. This chapter includes a section which describes the initial transition plan.

Figure 8-1 shows the overall schedule for ACE. The ACE Project Management Plan (PMP) provides a more detailed breakout of the tasks and schedule for the project. As shown in the chart, ACE will follow the Customs standard System Development Life Cycle (SDLC) phases. These phases, plus the transition plan, form the sections of this chapter.

**Figure 8-1 ACE Project Schedule**

8.1 Project Initiation

Completion of this Strategic Information Management Plan (SIMPlan) concludes the Project Initiation phase of the ACE project. During this phase, the Commissioner established the ACE project, the ADP Steering Committee approved the project approach, and plans and structures were developed to carry out the project. The SIMPlan, which depicts the overall view of ACE, is the primary plan developed during this phase. Another key deliverable, the PMP, lays out the tasks for each phase of the project, and the schedule and dependencies for these tasks. The PMP will be updated throughout the life of the project as the details of future phases become more clear and to accommodate any changes in direction. The transition plan from ACS to ACE (summarized in Section 8.6.1) was initiated, as was a budget and a financial plan. Finally, the acquisition plan was developed in concert with the Procurement Division to prepare for the procurement of the necessary technical support staff, equipment and hardware.

During this phase, the structures to support the project were established. The ACE Development Team was formed and a process for coordination with related projects (Selectivity Redesign, CARA, INTRADEX, and AES) was put in place. The Trade Compliance Process Owner, Chuck Winwood, was named. He formed his Board of Directors and, subsequently, established the Process Improvement Teams (PITs) which will define the processes to be supported by ACE. Two key support networks were also set up: the Field Support Network (FSN), consisting of Customs field users, and the Trade Support Network (TSN), with representatives from all segments of the trade community. All of these structures will be essential to the successful development and implementation of ACE.

8.2 Requirements Definition

Following completion of the SIMPlan, the ACE Development Team moves into the requirements definition stage which will last approximately six months. This time frame coincides with the schedule for the process design phase of the trade compliance process improvement effort. ACE Development Team members will participate on the PITs to document the operational requirements deriving from the process design effort. At the same time, the ACE Development Team will work with the field and trade support networks to learn their requirements for the new system. Other government agency requirements will be obtained via the INTRADEX project. The team will also document the functionality of the current ACS to ensure that no features are overlooked.

The requirements definition will be documented in narrative form and as data and function/activity models, using the Texas Instruments Information Engineering Facility (IEF). The purpose of this project phase is to, as the name implies, define users' needs for the new system; not to design how the system will be built. However, to facilitate an often difficult process, the ACE Development Team will construct simple prototypes to demonstrate the team's understanding of requirements; these will be used to solicit field input from the six Trade Compliance prototype ports and the ACE Field Support Network.

At the end of this phase, the team will seek formal approval of the documented requirements. However, these requirements will likely continue to evolve into a more detailed understanding and, in some cases, change as the subsequent design phase proceeds.

8.3 System Design

During this phase, the ACE Development Team will design the system architecture and functions that will meet the requirements defined in the preceding stage. A preliminary design will be developed first, followed by a detailed design. The preliminary design will be depicted with both narrative and IEF models, and again presented for approval before proceeding. This preliminary stage will take approximately three to four months. Prototypes will again be used to illustrate some of the design concepts.

The detailed design will occupy most of FY 96. During this stage, the emphasis will shift from user functionality to the design of the software programs, but close interaction with the user community will continue as screens/windows are designed and user requirements are further refined. Completion of the ACE database design is a key deliverable during this period. The details of the CDC-2000 architecture will also be brought into play as preliminary design concepts are integrated with the hardware, software, and communications components of the new environment. Prototypes will shift from demonstration of concepts and user requirements, to testing of performance, interoperability, and other technical issues. This stage will conclude with detailed specifications for the application software that will be built in the subsequent phases.

8.4 Development and Testing

FYs 97 and 98 will be devoted to writing and testing the ACE programs and to preparing for implementation. The ACE software will be divided into implementation packages designed to facilitate system implementation during the next phase. Each package will require the following: programming; unit testing; integration testing to

ensure interoperability with the rest of the package; system testing (with other packages); development of user manuals; training of field, trade community and other agency users; and, finally, system acceptance testing by the user community. The goal of this extended development period is to completely test each package and fully train the user community so that, during the implementation phase, efforts can focus on turning on the new system, rather than last minute system fixes and user training.

Coordination with the transition plan from ACS will be an important factor, especially for constructing the implementation packages. Each package, when implemented, will need to operate independently of the pending ACE components and in coordination with the ACS components that are still in operation. Section 8.6, Transition Strategy, explains this concept in more detail.

8.5 Implementation

During FY 99, ACE will be implemented in stages. The implementation packages developed in the prior phase will be successively implemented as the corresponding ACS components are phased out. If the development phase was successfully completed (i.e., packages operate as planned and users are trained), the major activities in this phase will be scheduling, software distribution, user sign-on, and correction of any start-up problems. By the end of FY 99, ACE should be fully operational.

8.6 Transition

As noted earlier, planning the transition from ACS to ACE is one of the most critical aspects of this project. Ensuring a smooth cut-over, successfully converting the existing ACS data, and maximizing use of the ACS resources, both personnel and software, are all essential to the success of the new system. For these reasons, Customs has already begun planning for the transition and expects to begin some of the transition activities early in the development cycle. Our goal is to integrate components of ACS with the ACE design during the requirements and design phases so that a redesigned ACS can serve as the first implementation phase of ACE. Not only will this greatly ease the transition, but some fundamentally improved system capabilities will be delivered much earlier than the project completion date for ACE.

This section describes the strategy and schedule for the transition plan, and the approach to defining the necessary changes to the current ACS. This transition plan will be completed with the necessary details over the next few months.

8.6.1 Transition Strategy

The ADP Steering Committee has approved an ACS/ACE Transition Strategy to prepare for the transition to ACE and to address the problem of setting priorities for the current ACS resources. Under this strategy, the Steering Committee has established an ACS enhancement window of two years (FYs 95 and 96), followed by a two-year maintenance/transition window (FYs 97 and 98) during which ACS resources will be dedicated to conversion to ACE and limited enhancement of the current system (including some Customs Modernization prototypes). The enhancements made during the initial two-year window will be designed as a comprehensive package with three objectives: addressing immediate mission priorities; preparing the system to operate in a two-year maintenance-only state; and facilitating the transition to ACE. This strategy addresses several interrelated requirements/problems:

- * *ACS Projects Schedule:* ACS carries an existing load of projects which will, in reality, never all be addressed. Because of limited resources and the unlimited number of new projects constantly added to the schedule, projects are continuously deferred to future quarters. This is exacerbated by inadequate requirements definition for many projects assigned to ACS. Further, the various projects are, for the most part, independent with no design integration.
- * *Customs Modernization and Chief Financial Officers Act:* Management feels a great sense of urgency to make ACS changes to implement certain aspects of these two acts. However, the changes needed are fundamental in nature, both for the system and operational processes. Making these changes quickly without the necessary attention to redesigning the system infrastructure will result in an inadequate implementation and/or serious impacts on other parts of the system. The changes envisioned also greatly impact the ACS resources already committed to existing projects.
- * *Transition to ACE:* The ACS redesign will result in a totally new system, ACE, with a new technology architecture, a restructured database, redesigned user functions and a very different user interface. Transitioning from ACS to ACE, in a manner that will minimize disruption for Customs users and the trade community, will be one of the most difficult and critical parts of the development process. The more that ACS continues to change and evolve, either further entrenching itself in its current structure or moving off into a direction different than ACE, the more difficult the transition will be.

In general, this approach couples the prioritization of ACS development projects with the need to prepare for transition to ACE. Defining a fixed schedule for implementation of the changes resulting from this prioritization and for moving into a maintenance/transition state is a way of focussing management attention and staff resources on only essential requirements for this process. A more detailed discussion

of this approach follows, with a description of the enhancement package components and the method in which they address the three criteria of the transition strategy.

8.6.2 Approach to Defining ACS Enhancements

In preparing this package of ACS enhancements, the criteria from the ACS/ACE transition strategy were applied as described below.

- * *Support for Transition:* The transition to ACE was approached from the viewpoint of the major system components in ACS and how they will be addressed in ACE. Figure 8-2 shows these components: trade interface, internal processing, database, and end-user functions. In general, the intention is to focus **either** ACS attention **or** ACE attention on these components to avoid multiple system changes and the resulting impact on Customs, other government agency, and trade community users. The planned move to the CDC-2000 architecture under ACE was also taken into account. Based on these factors, the ACS enhancement package will emphasize improvements to the trade interface component and related internal processes, and minimize changes to the database and end-user functions. Since the current ACS mainframe environment will continue to exist under CDC-2000 as the central processing layer and will continue to serve as the trade and other agency interface, upgrading the trade interface now will serve the current needs of ACS and the future needs of ACE. It will also give the trade community advanced notice of the changes planned under ACE and will require changes to their systems only once. The end-user functions, however, will be totally replaced under ACE as we move to new operational processes and a new technology environment (i.e., distributed, graphical user interface, etc.). Therefore, changes in this area will be minimized under ACS to avoid redundant use of resources and a double learning curve for Customs users.

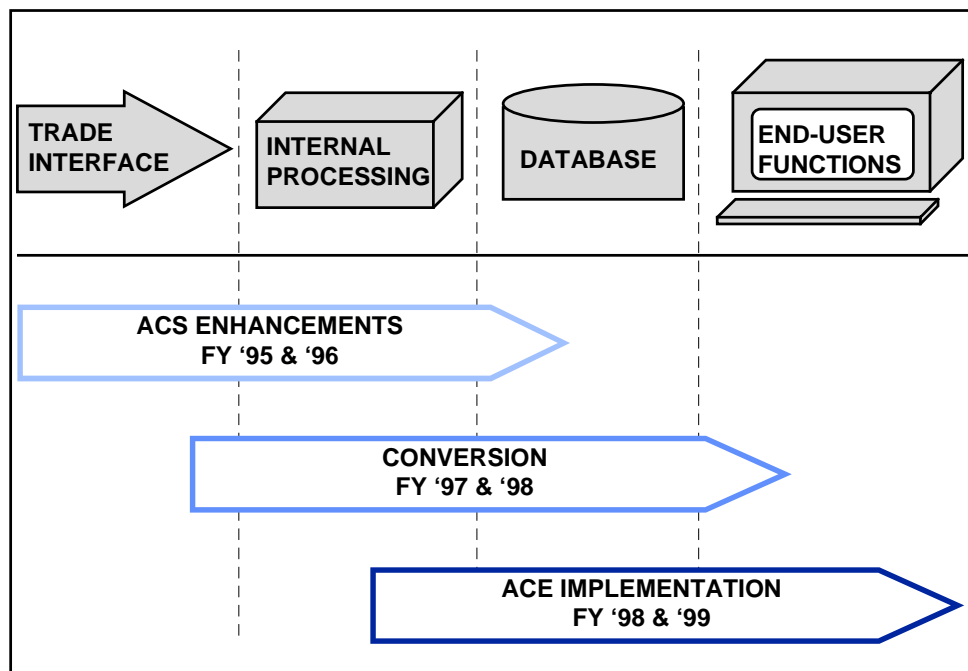


Figure 8-2 ACS to ACE Transition Strategy

The database component presents special challenges since it is integral to both the current ACS and the future ACE. Some type of parallel database strategy will be developed to accommodate the planned ACS changes and the necessary conversion to ACE, while offering some retrieval/downloading enhancements for field users. The relationship of the two-year ACS enhancement package, the subsequent two-year conversion period, and the implementation of ACE are shown in Figure 8.2.

- * *Preparation for ACS Maintenance Period:* This criterion addresses the underlying problems in ACS that lead to many of the continuing enhancement projects in ACS. Fortunately, the key problem areas fall within the same system components as those identified by the transition criterion: trade interface and internal processing. By correcting how we receive and process trade community data, we will eliminate a large part of the central processing overhead which has required so many computer upgrades. We will also address a number of recurring user concerns and eliminate some of the underlying problems that make system maintenance difficult. As noted in the discussion of the transition criterion, however, the extent of changes needed to the database will require further analysis.
- * *Mission Priorities:* This was the most difficult criterion to address. Are mission priorities defined by the many existing ACS projects and the priorities (often competing) assigned by the headquarters offices, or are they a higher level concept defined by the five year plan and statutory requirements? We recommend that the ADP Steering Committee, in approving the ACS/ACE transition strategy, take the latter view. For this reason, implementation of the Customs Modernization Act, addressing CFO concerns, and moving toward the new direction defined by the reorganization study and the recent trade compliance vision are identified as the driving mission priorities. As much as possible, these priorities are integrated with the system components derived from the other criteria.

8.6.3 ACS Enhancement Package Components

Based on the criteria discussed above, the following enhancements have been proposed for ACS for FYs 95 and 96. These proposed enhancements are still under consideration by the ADP Steering Committee, but they give a good idea of the kinds of changes needed in ACS to support the transition to ACE. Whatever set of enhancements are finally approved, all must be designed and implemented as an integrated package.

- * *Trade Interface/Single Entry Declaration:* This fundamental change in ACS drives the other components of this enhancement package. The currently separate processes for capturing manifest, entry, and entry summary information will be pulled together and redesigned as a single point of data capture for all transactions. This change will include: designing the new entry declaration and the processes for handling it; redesigning AMS/ABI to modernize the transmission technology and accommodate the new declaration; creating an entry number index; and, completing the electronic invoice process to interface with the new single entry declaration.
- * *Single Selectivity System:* Moving to a Single Entry Declaration will simplify and facilitate implementation of the concepts emerging from the Selectivity Redesign project. The multiple selectivity processes (manifest, entry, and entry summary) will be replaced by a single process that operates against the new entry declaration and addresses all targeting needs in one pass.
- * *Remote Location Filing:* The Single Entry Declaration should also facilitate implementation of remote location filing, at least the Phases I and II described by the remote location filing group. In developing the new entry and selectivity approaches, remote location filing of entries and specified examination sites should be built as an integral component. Two remote location filing prototypes are currently planned: one in April 1995, and the second in April 1996. Full remote location filing, with workload leveling and account-based processing, however, will need to wait for the full implementation of ACE.
- * *In-bond Improvements:* The In-Bond Task Force proposed major changes to the handling of in-bond movements. Although debate will continue with the trade community over this proposal, changes are clearly needed and must be interwoven with the Single Entry Declaration, remote location filing, and selectivity. Therefore, the results of the In-Bond Task Force effort should be included in the enhancement package and designed as an integral component of the other changes proposed for ACS.
- * *Single Entry Declaration at Land Borders (Line Release):* One of the key areas of debate over remote location filing is the application of this approach at land borders where line release is employed. Line release is also an exception to the standard selectivity processing. Further, a number of requested line release improvements remain outstanding. These needed improvements to line release should not be viewed independently, but in the context of the overall direction for trade compliance. From this viewpoint, the issue should be how to implement the single entry declaration at land borders. Part of the enhancement package should address the special requirements for implementing the other components

of the package (single entry declaration, remote location filing, single selectivity, in-bond improvements) at the land border.

- * *Chief Financial Officer Act Improvements:* The current list of ACS projects includes more than 50 enhancements that note "CFO" as a requirement for their implementation. Although these projects may all support aspects of CFO compliance, this individual project approach does not provide a cohesive picture of what is needed to address our fundamental CFO problems related to ACS. The enhancement package should include a CFO component that pulls together the applicable parts of these current projects, defines the real CFO benefits that will be gained, and integrates these improvements into the overall design for the enhancement.
- * *TECS Involvement:* The ACS/ACE transition strategy, as would be expected, focussed on the current ACS as the starting platform for moving to the new ACE. However, in light of the more expansive systems view of the Automated Commercial Environment and the long-running user desire for tighter links to the data in our enforcement system, TECS also should be included in the transition discussion. The need for this inclusion is demonstrated by the linking of FP&F and traditional Office of Investigations functions in the *Enforce* process of the Trade Compliance Vision. Further, the recent establishment of a new FP&F redesign effort and the TECS-initiated Customs Enforcement Incident Report (CEIR) project suggests that some synergy could be derived by linking these efforts. At a recent meeting chaired by the Assistant Commissioner for Field Operations, a project was proposed to integrate SEACATS, a PC-based system for collecting seizure and FP&F information with CNETS. CNETS is a TECS-based proposal to redesign the current Search/Arrest/Seizure system for capturing Customs case and enforcement information. It has been decided to develop SEACATS as a prototype which will interface with TECS. The ADP Steering Committee will review the decision to use the SEACATS prototype. Full implementation will be based on the prototype's evaluation. During the ACS to ACE conversion period (FY 97 and 98), the appropriate links will be developed to ensure a seamless interface between SEACATS and the Trade Compliance processes.

APPENDIX A: AUTOMATED COMMERCIAL ENVIRONMENT (ACE) DEVELOPMENT TEAM MEMBERS

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Verify Team

David Austin, Lead
Jill Charles
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Enforce Team

APPENDIX B: FIELD SUPPORT NETWORK MEMBERS

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Champlain:

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Denver:

Sharon L. MacTavish, Inspector

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APPENDIX C: TRADE SUPPORT NETWORK MEMBERS

Trade Representatives as of November 21, 1994:

- Air Courier Conference of American
- Air Transport Association
- American Association of Exporters and Importers
- American Association of Port Authorities
- American President Lines
- Arthur Andersen & Co.
- Association of American Railroads
- Automotive Industry Action Group
- C.H. Robinson International Inc.
- Compaq Computer Corporation
- IBM
- International Air Transport Association
- National Customs Brokers & Forwarders Association
- Transportation Coalition

These members represent a wide spectrum of the trade community which include brokers, importers, couriers, carriers, transporters, vendors and industry. Additional membership is expected in the future.

APPENDIX D: GLOSSARY

3270 Emulation	Character-based systems work from an old technology known as a 3270 (dumb) terminal. Personal computers work in a more graphic mode and thus an emulation hardware board is added to the PC which allows for character-based display.
ABI	Automated Broker Interface; method by which brokers or importers port authorities and independent service bureaus transmit entry and release data electronically to the USCS.
ACE	Automated Commercial Environment; the new automated system which will replace the Customs Automated Commercial System (ACS), and which will integrate with Customs enforcement and administrative systems.
ACH	Automated Clearinghouse; an electronic payment method for Customs duties, taxes and fees.
ACS	Automated Commercial System composed of many different modules is the comprehensive tracking controlling and processing system of the USCS for commercial information.
AMS	Automated Manifest System; allows carriers to provide electronic manifest data to Customs. There is one system for sea carriers and another for air carriers.
ATS	Automated Targeting System; a Customs-developed artificial intelligence application which is used to target manifests for verification of compliance.
Bandwidth	Data is transmitted via communication lines and these lines have a limit as to how much information can be transmitted at a given time. Bandwidth is the indicator of how much data can be transmitted, the larger the width the more data that can be passed.
Biometric	Biometrics systems - are automated techniques for verifying or recognizing the identity of a living person based on some physiological characteristic, such as a fingerprint or iris pattern, or some behavior, such as handwriting or keystroke patterns.

CDC - 2000	Customs Distributed Computing for the year 2000
CPU	Central Processing Unit; the heart of a computer system, which performs arithmetic, logic, and short-term data storage. In the IBM environment, it is also call a processor.
Datacom/DB	A commercial data base management system (DBMS) owned by Computer Associates (CA.) The DB notation stands for Data Base.
Distributed Computing	A technique of dividing the work of an application among multiple machines.
DOS	Disk Operating System (MS DOS is Microsoft's version of DOS)
GUI	Graphical User Interface; the process which describes the Icon/Window concept vs the old character base system.
Hypertext	Presents pop-up menu or dialog box when user clicks on text or graphic
IEF	Information Engineering Facility; a computer-aided software enginnering (CASE) tool from Texas Instruments
INTRADEx	International Trade Data Exchange
LAN	Local Area Network (Network); Collection of PCs under one or more controlling file handler
MVS	Multiple Virtual Storage; part of the operating system of a mainframe computer
PC	Personal Computer
RISC	Reduce Instruction Set Computing; a sub-set of CISC (Complex Instruction Set Computing); machines have simpler instruction sets and achieve higher instruction rates than CISC machines by avoiding microcoded instructions.
SQL	Structured Query Language; provides an interface to define, retrieve, insert, delete and update information in a relational database.
TCS	Treasury Communication System - a international (mostly national) network support all of US treasury

communication needs.

Windows

A function that allows users to divide the screen into multiple independent areas. Windows can be scrolled, re-sized or moved, and usually are provided by the operating system or related presentation tools. Customs is using Microsoft's 3.1 or higher version of windows.

WYSIWYG

Pronounced "WIZ E WIG" - means "What You See Is What You Get" When GUI displays were first shown on the screen people found that when they printed that display the printed output was not like the screen. WYSIWYG states that both the display and printing are the same.

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